CHILD DEVELOPMENT

Vol. 27
September, 1956
No. 3

Published Quarterly by

CHILD DEVELOPMENT PUBLICATIONS

OF THE

SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT, INC.

Contents for September

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CHILD DEVELOPMENT PUBLICATIONS
(of The Society for Research in Child Development, Inc.)
Purdue University
Lafayette, Indiana

Made in United States of America

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Printed by
THE ANTIOCH PRESS
Yellow Springs, Ohio

CHILDREN'S WORK ATTITUDES AND SIBLING CHARACTERISTICS [1,2]

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PROBLEM AND PROCEDURES

This study is part of a larger one concerned with the effects on the personality of children of characteristics of their siblings. We are reporting here our data bearing on the relation between certain work habits and attitudes of the five- and six-year-old from two-child, white, native-born, intact, urban families and the ordinal position of the child, the age difference which separates him from his sibling and his sex in relation to that of his sibling. Sex differences were also noted. The habits and attitudes explored were aggressiveness or initiative, curiosity, originality, number of interests, enthusiasm, ambition, responsibleness, tenacity, planfulness, and tendency to dawdle or procrastinate.

Our child subjects numbered 384. The experimental design included three sib-spacing levels, two ordinal positions, subjects of two sexes and siblings of two sexes. There were 48 children in each of the following categories—male with a male sib older, male with a male sib younger, male with a female sib older, male with a female sib younger, female with a male sib older, female with a male sib younger, female with a female sib older and female with a female sib younger. Each of these groups of 48 children was composed of three subgroups of 16 children, representing the following three sibling-age-difference levels: siblings differed in age by under two years, by two to four years, and four to six years, respectively. Hence our basic subgroups of 16 each numbered 24.

[1] The investigation was supported, in part, by a grant from the National Institute of Mental Health, of the National Institutes of Health, U. S. Public Health Service, and, in part, by the Sonia Shankman Orthogenic School Research Fund, University of Chicago.

[2] The author wishes to acknowledge the help received from, and to express her gratitude to, the teachers and principals of the following schools in Chicago which participated in the Study: Bennett School, Bradwell School, Field School, Holmes School, Gunsalus School, Luella School, Perry School, Schmid School, Sullivan School, Wentworth School, University of Chicago Laboratory School and the University of Chicago Nursery School. The author is also much indebted to Dr. Grace Munson and Dr. Thelma Thurstone, both formerly Directors of the Bureau of Child Study, Chicago Public Schools. Dr. Helen Heath did most of the statistical work for the study. We acknowledge with gratitude her discriminating and loyal services.

TABLE 1

MEANS OF THE NORMALIZED RATINGS FOR THE VARIOUS SUBGROUPS: *AGGRESSIVENESS** AND *CURIOSITY**

Subgroup: Subject Sex	Subject Ordinal Position	Sibling Sex	*Aggressiveness** Age difference between siblings in months: 7–24	25–48	49–72	Total	*Curiosity** Age difference between siblings in months: 7–24	25–48	49–72	Total
			SCORE MEANS				SCORE MEANS			
M	2	M	3.926	4.068	4.471	4.155	3.699	3.728	4.284	3.904
M	2	F	3.782	3.793	3.860	3.812	3.854	3.848	3.942	3.881
F	2	M	3.982	4.157	4.114	4.084	3.774	4.094	3.827	3.899
F	2	F	3.990	4.131	4.047	4.056	3.966	3.604	3.913	3.828
M	1	M	3.646	3.993	4.313	3.984	4.179	3.847	4.211	4.079
M	1	F	3.580	4.616	3.933	4.043	3.906	4.344	4.448	4.233
F	1	M	4.392	4.114	4.466	4.324	4.378	4.213	4.552	4.381
F	1	F	4.154	4.061	3.924	4.046	3.876	3.815	4.133	3.941
M	2	M or F	3.854	3.930	4.166	3.983	3.776	3.788	4.113	3.892
F	2	M or F	3.986	4.144	4.081	4.070	3.870	3.849	3.870	3.863
M	1	M or F	3.613	4.304	4.123	4.013	4.043	4.095	4.329	4.156
F	1	M or F	4.273	4.088	4.195	4.185	4.127	4.014	4.342	4.161
M or F	2	M	3.954	4.112	4.293	4.120	3.737	3.911	4.056	3.901
M or F	2	F	3.886	3.962	3.953	3.934	3.910	3.726	3.928	3.854
M or F	1	M	4.019	4.053	4.390	4.154	4.278	4.030	4.381	4.230
M or F	1	F	3.867	4.338	3.928	4.045	3.891	4.079	4.290	4.087
M	1 or 2	M	3.786	4.030	4.392	4.070	3.939	3.788	4.248	3.991
M	1 or 2	F	3.681	4.205	3.896	3.927	3.880	4.096	4.195	4.057
F	1 or 2	M	4.187	4.136	4.290	4.204	4.076	4.153	4.189	4.140
F	1 or 2	F	4.072	4.096	3.985	4.051	3.921	3.709	4.023	3.884
M	1 or 2	M or F	3.734	4.117	4.144	3.998	3.909	3.942	4.221	4.024
F	1 or 2	M or F	4.129	4.116	4.138	4.128	3.998	3.931	4.106	4.012
M or F	1 or 2	M	3.987	4.083	4.341	4.137	4.008	3.971	4.218	4.066
M or F	1 or 2	F	3.876	4.150	3.941	3.989	3.900	3.903	4.109	3.971
M or F	2	M or F	3.920	4.037	4.123	4.027	3.823	3.819	3.992	3.878
M or F	1	M or F	3.943	4.196	4.159	4.099	4.085	4.055	4.336	4.158
M or F	1 or 2	M or F	3.932	4.117	4.141	4.063	3.954	3.937	4.164	4.018

We shall refer to these groups in code as follows: the first letter and number will indicate the sex of the child subject and his ordinal position, the second letter the sex of the sibling and the numbers in parentheses the age difference in months which separates the child and his sib. Thus M2F(25-48) refers to second-born boys who have one sister two to four years older.

The measures of the dependent variables were teachers' ratings. Five of the scales (the starred ones in Tables 1 to 5) were taken from the Fels Child Behavior Rating Scales (16); five (the unstarred scales in Tables 1 to 5), from the California Behavior Inventory for Nursery School Children (4). The ratings were made by the teachers on a line scale. Their checkings were then transmuted to ratings on a nine-point scale. These ratings, in turn, were normalized on the basis of a population of 498 five- and six-year olds of which our subjects were the major part. Four was taken as the mean score for each trait in the total population. The Bartlett test (7, pp. 195-200) was applied to determine whether the ratings could be assumed to be drawn from populations with similar variance and this was found to be the case. For the likely reliabilities of our measures, see (5) and (16).

The means for our various groups are presented in Tables 1 to 5 and the analysis of variance data are offered in Table 6. Only data for the total population are presented. We shall report in the text significant relations that obtain only for subgroups. In Table 6, *F*'s are included only when the group differences are significant at the 5 per cent point or better. When it seemed indicated, *t*'s were computed for the subgroup differences but in the interest of economy these are not presented. It can be assumed the differences we discuss are significant, or very near significance, at the 5 per cent point or better unless we specify otherwise.

The groups were matched individual by individual in age and in the socio-economic status of the father's occupation (8) as well as of the neighborhood of the family residence (14). The group compositions have been described in detail in an earlier publication in this journal (11). Matching, of course, could not be exact, but 98 per cent of the children were matched within six months of age, and 75 per cent within four months; 93 per cent, within one occupational level; and 88 per cent, within one rank on the neighborhood scale. Level 4 of the occupation scale was omitted, as our subjects were all city children. The children were drawn chiefly from the public schools of Chicago, only one private school system, the University of Chicago Laboratory Schools, contributing subjects. (For a discussion of some of the matching and sampling problems we faced the reader is referred to (10) and (11).)

The traits studied probably, in the main, need no definition here. The trait, aggressiveness, refers to initiative and dominance rather than to hostility. By tenacity is meant persistence toward a goal and long attention span.

TABLE 2

MEANS OF THE NORMALIZED RATINGS FOR THE VARIOUS SUBGROUPS: *ORIGINALITY** AND *NUMBER OF INTERESTS*

SUBGROUP										
Subject		Sibling	*Originality**				*Number of Interests*			
Sex	*Ordinal Position*	*Sex*	AGE DIFFERENCE BETWEEN SIBLINGS IN MONTHS *7–24*	*25–48*	*49–72*	*Total*	*7–24*	*25–48*	*49–72*	*Total*
			SCORE MEANS				SCORE MEANS			
M	2	M	3.748	4.085	4.204	4.013	3.740	4.079	4.491	4.103
M	2	F	3.814	3.906	3.786	3.835	3.630	3.807	3.782	3.740
F	2	M	3.976	4.326	4.156	4.152	3.840	3.979	4.091	3.970
F	2	F	4.309	3.778	4.111	4.066	4.175	3.882	3.886	3.981
M	1	M	3.860	4.009	4.006	3.958	3.878	3.846	4.074	3.933
M	1	F	4.063	4.072	4.043	4.028	3.814	4.080	4.405	4.100
F	1	M	4.144	4.096	4.164	4.135	4.132	4.134	4.344	4.203
F	1	F	3.961	3.937	3.817	3.905	3.944	3.734	4.166	3.948
M	2	M or F	3.781	3.995	3.995	3.924	3.685	3.943	4.137	3.922
F	2	M or F	4.143	4.052	4.133	4.109	4.008	3.931	3.988	3.976
M	1	M or F	3.962	3.993	4.024	3.993	3.846	3.963	4.239	4.016
F	1	M or F	4.052	4.017	3.991	4.020	4.038	3.934	4.255	4.076
M or F	2	M	3.862	4.205	4.180	4.082	3.790	4.029	4.291	4.037
M or F	2	F	4.062	3.842	3.948	3.951	3.903	3.844	3.834	3.860
M or F	1	M	4.002	4.053	4.085	4.047	4.005	3.990	4.209	4.068
M or F	1	F	4.012	3.957	3.930	3.966	3.879	3.907	4.285	4.024
M	1 or 2	M	3.804	4.047	4.105	3.985	3.809	3.963	4.283	4.018
M	1 or 2	F	3.938	3.941	3.914	3.931	3.722	3.944	4.093	3.920
F	1 or 2	M	4.060	4.211	4.160	4.144	3.986	4.057	4.217	4.087
F	1 or 2	F	4.135	3.858	3.964	3.985	4.059	3.808	4.026	3.964
M	1 or 2	M or F	3.871	3.994	4.010	3.958	3.766	3.953	4.188	3.969
F	1 or 2	M or F	4.097	4.034	4.062	4.065	4.023	3.932	4.122	4.026
M or F	1 or 2	M	3.932	4.129	4.133	4.064	3.898	4.010	4.250	4.052
M or F	1 or 2	F	4.037	3.899	3.939	3.958	3.891	3.876	4.060	3.942
M or F	2	M or F	3.962	4.024	4.064	4.017	3.846	3.937	4.063	3.949
M or F	1	M or F	4.007	4.005	4.008	4.006	3.942	3.949	4.247	4.046
M or F	1 or 2	M or F	3.984	4.014	4.036	4.011	3.894	3.943	4.155	3.997

Results

We shall here summarize the major findings of the study in outline form, since they are rather complicated, many interactions being significant. Discussion will be reserved for a later section.

Sib-Age-Disparity-Group Differences

1. The wider the age gap between the sibs the higher were the ratings on number of interests (Tables 2 and 6).

2. At the middle spacing FM's exceeded FF's in rating on tenacity and at the close spacing F1M's scored higher than F1F's but M2M(49-72)'s exceeded in score M2F(49-72)'s (Tables 4 and 6).

3. At the close spacing girls received a higher mean rating in aggressiveness than boys (Tables 1 and 6).

4. At the widest spacing those with a male sib were judged more aggressive than those with a female sib (Tables 1 and 6).

5. At the sib-age-difference levels under four years girls were gauged more tenacious than boys (Tables 4 and 6). Sex differences were greatest among the children who had a brother.

Sib's-Sex-Group Differences (See Items 2 and 4.)

6. The children with a brother were assessed as more aggressive, on the average, than those with a sister, when the sib disparity in age was four to six years (Tables 1 and 6).

7. Those children from opposite-sex sib pairs who differed from their sib two to four years in age were rated higher in curiosity than those from same-sex pairs. F1M's at all spacings scored higher than F1F's (Tables 1 and 6).

8. The children among first-borns whose sib differed in sex received higher ratings on enthusiasm and number of interests than the children whose sib was of the same sex; but among second-borns those with a male sib exceeded in their rating on enthusiasm those with a female sib and M2M's scored higher than M2F's in number of interests (Tables 2, 3 and 6).

9. In the main, the ratings on ambition of the children with a male sib were higher than those for children with a female sib. This trend was especially marked in the case of girls at the spacings under four years and in the case of second-born males (Tables 3 and 6).

10. First-born girls with a brother at the sib spacings up to four years received higher ratings on tenaciousness or dominance than did those with a sister, and at the middle spacing the sib-sex relation held among second-born girls as well. When the sibs differed in age four to six years, M2M's scored higher than M2F's (Tables 4 and 6).

Ordinal-Position-Group Differences (See Items 2, 8 and 10.)

11. First-borns scored higher than second-borns in curiosity (Tables 1 and 6).

TABLE 3

MEANS OF THE NORMALIZED RATINGS FOR THE VARIOUS SUBGROUPS: *ENTHUSIASM* AND *AMBITION*

Subgroup: Subject Sex	Subject Ordinal Position	Sibling Sex	*Enthusiasm* 7–24	*Enthusiasm* 25–48	*Enthusiasm* 49–72	*Enthusiasm* Total	*Ambition* 7–24	*Ambition* 25–48	*Ambition* 49–72	*Ambition* Total
			Age difference between siblings in months: score means				Age difference between siblings in months: score means			
M	2	M	3.761	4.008	4.515	4.095	3.991	4.230	4.264	4.162
M	2	F	3.698	3.446	3.674	3.606	3.682	3.658	3.720	3.687
F	2	M	4.179	4.531	4.172	4.294	4.173	4.226	4.273	4.224
F	2	F	4.129	3.799	3.824	3.918	3.946	3.759	4.260	3.989
M	1	M	3.779	3.908	4.044	3.910	3.753	3.760	4.129	3.881
M	1	F	3.898	4.354	4.321	4.191	4.043	3.828	4.004	3.958
F	1	M	4.184	4.335	4.654	4.391	4.251	4.346	3.989	4.195
F	1	F	3.918	3.879	4.146	3.981	3.953	3.824	4.001	3.926
M	2	M or F	3.729	3.727	4.095	3.850	3.836	3.944	3.992	3.924
F	2	M or F	4.154	4.165	3.998	4.106	4.060	3.993	4.267	4.106
M	1	M or F	3.838	4.131	4.183	4.051	3.898	3.794	4.067	3.920
F	1	M or F	4.051	4.107	4.400	4.186	4.102	4.085	3.995	4.061
M or F	2	M	3.970	4.269	4.343	4.194	4.082	4.228	4.268	4.193
M or F	2	F	3.913	3.622	3.749	3.762	3.814	3.709	3.990	3.838
M or F	1	M	3.981	4.121	4.349	4.150	4.002	4.053	4.059	4.038
M or F	1	F	3.908	4.117	4.234	4.086	3.998	3.826	4.002	3.942
M	1 or 2	M	3.770	3.958	4.279	4.002	3.872	3.995	4.197	4.021
M	1 or 2	F	3.798	3.900	3.998	3.899	3.863	3.743	3.862	3.823
F	1 or 2	M	4.182	4.433	4.413	4.342	4.212	4.286	4.131	4.210
F	1 or 2	F	4.023	3.839	3.985	3.949	3.949	3.792	4.130	3.957
M	1 or 2	M or F	3.784	3.929	4.139	3.950	3.867	3.869	4.029	3.922
F	1 or 2	M or F	4.103	4.136	4.199	4.146	4.081	4.039	4.131	4.083
M or F	1 or 2	M	3.976	4.195	4.346	4.172	4.042	4.141	4.164	4.115
M or F	1 or 2	F	3.911	3.869	3.992	3.924	3.906	3.768	3.996	3.890
M or F	2	M or F	3.942	3.946	4.046	3.978	3.948	3.968	4.129	4.015
M or F	1	M or F	3.945	4.119	4.291	4.118	4.000	3.940	4.031	3.990
M or F	1 or 2	M or F	3.943	4.032	4.169	4.048	3.974	3.954	4.080	4.003

12. Children whose sib was their junior and opposite in sex were judged to have a greater number of interests and greater enthusiasm than those whose sib was of the same sex. However, in the two traits named above M2M's scored higher than M2F's (Tables 2, 3 and 6).

13. First-born males at the under-two-year spacing received a higher rating in planfulness than second-borns but the trend was not consistent for girls (Tables 5 and 6).

14. The rating given first-born girls on the trait, tendency to dawdle and procrastinate, was higher, on the average, than that given second-born girls. No similar trend was noted for boys (Tables 5 and 6).

Sex-Group Differences (See Items 3, 5, 9, 13 and 14.)

15. Girls were judged more aggressive than boys when the sib gap was less than two years (Tables 1 and 6).

16. Generally girls were rated more enthusiastic than boys but first-born boys with a sister two to four years younger scored higher than the parallel group of girls (Tables 3 and 6).

17. Girls tended to receive a higher rating on responsibleness, tenacity and planfulness than boys. In the first two traits the sex difference was significant at the spacings under four years, in the third, only when the sib age difference was under two years (Tables 4, 5 and 6).

18. Second-born boys were judged to dawdle and procrastinate more than second-born girls but no consistent sex differences are to be noted among first-borns (Tables 5 and 6).

Some Group Characterizations

A. M2M's, as the sib age difference widened, showed more aggressiveness, curiosity, originality, enthusiasm and planfulness and were judged to be possessed of more interests. The trend in the case of the other traits, with the exception of procrastination, was similar but group differences were not large enough to be statistically significant. Generally speaking, then, the wider the sib age difference, the more effective this group type became.

The difference between M2M's and M2F's increased with spacing and was significant at the four-year spacing in the case of aggressiveness, enthusiasm, ambition, tenacity and number of interests, M2M's receiving the higher assessment.

M2M's tended not to differ significantly from parallel groups of M1M's but at the widest spacing scored higher in enthusiasm and at the closest spacing, lower in curiosity.

B. M2F's, in contrast to M2M's, changed little as the age difference between them and their sib expanded and seemed to rank rather low generally. They scored less than M2M's on most traits studied and were rated significantly lower in many at the widest spacing (Item A). When the sib age difference was under two years, the former also scored significantly or

TABLE 4

MEANS OF THE NORMALIZED RATINGS FOR THE VARIOUS SUBGROUPS: *RESPONSIBLENESS* AND *TENACITY*•

SUBGROUP			*Responsibleness*				*Tenacity*•			
Subject		Sibling	AGE DIFFERENCE BETWEEN SIBLINGS IN MONTHS							
Sex	*Ordinal Position*	*Sex*	*7–24*	*25–48*	*49–72*	*Total*	*7–24*	*25–48*	*49–72*	*Total*
			SCORE MEANS				SCORE MEANS			
M	2	M	3.716	3.773	4.040	3.843	3.736	3.826	4.048	3.870
M	2	F	3.884	3.916	3.685	3.828	3.675	3.932	3.601	3.736
F	2	M	4.569	4.560	3.943	4.357	4.318	4.558	4.020	4.298
F	2	F	4.127	3.741	4.143	4.004	4.413	3.709	4.194	4.105
M	1	M	3.763	3.627	3.954	3.781	3.952	3.761	4.095	3.936
M	1	F	3.786	3.396	3.789	3.657	3.608	3.871	3.913	3.797
F	1	M	3.892	4.195	4.159	4.082	4.169	4.563	4.023	4.252
F	1	F	4.206	4.106	4.117	4.143	3.629	3.996	4.017	3.880
M	2	M or F	3.800	3.844	3.863	3.836	3.706	3.879	3.825	3.803
F	2	M or F	4.348	4.151	4.043	4.180	4.365	4.133	4.107	4.202
M	1	M or F	3.774	3.512	3.872	3.719	3.780	3.816	4.004	3.867
F	1	M or F	4.049	4.150	4.138	4.112	3.899	4.279	4.020	4.066
M or F	2	M	4.143	4.167	3.991	4.100	4.027	4.192	4.034	4.084
M or F	2	F	4.005	3.828	3.914	3.916	4.044	3.820	3.898	3.921
M or F	1	M	3.827	3.911	4.057	3.932	4.060	4.162	4.059	4.094
M or F	1	F	3.996	3.751	3.953	3.900	3.618	3.933	3.965	3.839
M	1 or 2	M	3.739	3.700	3.997	3.812	3.844	3.793	4.072	3.903
M	1 or 2	F	3.835	3.656	3.737	3.743	3.642	3.902	3.757	3.767
F	1 or 2	M	4.231	4.378	4.051	4.220	4.243	4.560	4.021	4.275
F	1 or 2	F	4.166	3.924	4.130	4.073	4.021	3.852	4.105	3.993
M	1 or 2	M or F	3.787	3.678	3.867	3.777	3.743	3.848	3.914	3.835
F	1 or 2	M or F	4.198	4.150	4.090	4.146	4.132	4.206	4.063	4.134
M or F	1 or 2	M	3.985	4.039	4.024	4.016	4.044	4.177	4.046	4.089
M or F	1 or 2	F	4.001	3.790	3.933	3.908	3.831	3.877	3.931	3.880
M or F	2	M or F	4.074	3.998	3.953	4.008	4.035	4.006	3.966	4.002
M or F	1	M or F	3.912	3.831	4.005	3.916	3.839	4.048	4.012	3.966
M or F	1 or 2	M or F	3.993	3.914	3.979	3.962	3.937	4.027	3.989	3.984

near significantly lower than F2F's in originality, number of interests, enthusiasm, planfulness and tenacity as well as higher in dawdling. At the widest spacing M2F's received a lower rating in ambition, responsibleness and tenacity and a higher one in dawdling. The former were usually judged somewhat lower in curiosity, enthusiasm, planfulness and number of interests than M1F's—e.g., at the middle spacing they scored significantly lower in aggressiveness, curiosity and enthusiasm; and at the widest, significantly lower in curiosity, number of interests and enthusiasm. Their picture, then, is that of a somewhat passive, depressed group. Other data we have indicate them to be distinctly sissyish, hostile and not very friendly (10, 11, 12).

C. F2M's showed few significant spacing-group differences. As the sib age difference widened, the ratings in planfulness and dawdling increased. Scores in responsibleness and tenacity were lower at the wide than at the middle spacing. When compared with the F1M's, F2M's rated lower in curiosity and tendency to procrastinate but at the two closer spacings were judged more responsible. They were judged significantly more curious, original, enthusiastic, ambitious, responsible, tenacious and less given to dawdling than the F2F's when the sib age difference was two to four years. They did not differ significantly from the M2M's, except that they scored at the two closer spacings higher in the traits of responsibleness and tenacity, in which girls generally tend to excel; at the middle spacing, higher in enthusiasm; and at the under-two-year spacing, lower in procrastination.

The F2M's, hence, appear to be a rather dynamic group, often scoring higher than any of the other second-borns (this, however, not significantly usually except relative to the M2F's). The total pattern of the data suggests that having an older sib opposite in sex may be more stimulating for the girl than for the boy.

D. F2F's differed little from the F2M's except at the middle spacing (Item C), where they tended to score lower on most of the traits studied. The former differed little also from F1F's. At the wide spacing they were judged to dawdle less; at the close spacing, to be more tenacious than the latter. When the sibs are of the same sex, ordinal position differences seem slight (see M2M's as well).

F2F's showed some spacing differences, being at the two-to-four-year spacing judged significantly less original, tenacious and planful than at the under-two-year spacing and, when the middle spacing is compared with the wide, the former group was rated higher in procrastination and lower in ambition and tenacity. In other words, the F2F's seemed to show a low at the two-to-four-year spacing, while, if anything, the F2M's tended to score relatively high at the same level. We shall comment on this in the discussion.

E. The M1M's, like the M2M's, showed greater aggressiveness the wider the sib age gap. While the spacing-group differences were usually insignifi-

cant, the trend in the case of most traits was in a positive direction, as the sib age gap widened—i.e., the score at the widest spacing was usually the highest, though not significantly so. In the main, the M1M's did not differ significantly from the M2M's, but at the close spacing the former were judged the more curious and at the widest spacing, the less enthusiastic.

TABLE 5

MEANS OF THE NORMALIZED RATINGS FOR THE VARIOUS SUBGROUPS: *PLANFULNESS** AND *TENDENCY TO DAWDLE AND PROCRASTINATE*

SUBGROUP			*Planfulness**				*Tendency to Dawdle and Procrastinate*			
Subject		Sibling	AGE DIFFERENCE BETWEEN SIBLINGS IN MONTHS							
Sex	*Ordinal Position*	*Sex*	*7–24*	*25–48*	*49–72*	*Total*	*7–24*	*25–48*	*49–72*	*Total*
			SCORE MEANS				SCORE MEANS			
M	2	M	3.484	3.769	3.984	3.746	4.099	3.813	3.929	3.947
M	2	F	3.606	3.887	3.919	3.804	4.273	4.126	4.241	4.213
F	2	M	3.816	4.096	4.367	4.093	3.419	3.619	3.913	3.650
F	2	F	4.441	3.972	4.049	4.154	3.831	4.064	3.580	3.825
M	1	M	4.028	3.646	4.104	3.926	3.924	4.166	4.104	4.065
M	1	F	4.283	4.100	3.997	4.127	4.175	3.939	3.894	4.003
F	1	M	4.294	3.989	4.233	4.172	4.314	3.950	4.077	4.114
F	1	F	4.072	3.730	4.138	3.980	4.133	4.038	4.282	4.151
M	2	M or F	3.545	3.828	3.951	3.775	4.186	3.969	4.085	4.080
F	2	M or F	4.128	4.034	4.208	4.123	3.625	3.842	3.747	3.738
M	1	M or F	4.155	3.873	4.050	4.026	4.049	4.052	3.999	4.034
F	1	M or F	4.183	3.859	4.186	4.076	4.223	3.994	4.179	4.132
M or F	2	M	3.650	3.933	4.175	3.919	3.759	3.716	3.921	3.799
M or F	2	F	4.023	3.929	3.984	3.979	4.052	4.095	3.910	4.019
M or F	1	M	4.161	3.818	4.168	4.049	4.119	4.058	4.091	4.089
M or F	1	F	4.178	3.915	4.068	4.053	4.154	3.988	4.088	4.077
M	1 or 2	M	3.756	3.708	4.044	3.836	4.011	3.989	4.017	4.006
M	1 or 2	F	3.944	3.994	3.958	3.965	4.224	4.032	4.067	4.108
F	1 or 2	M	4.055	4.042	4.300	4.132	3.867	3.784	3.995	3.882
F	1 or 2	F	4.257	3.851	4.094	4.067	3.982	4.051	3.931	3.988
M	1 or 2	M or F	3.850	3.851	4.001	3.900	4.118	4.011	4.042	4.057
F	1 or 2	M or F	4.156	3.947	4.197	4.100	3.924	3.918	3.963	3.935
M or F	1 or 2	M	3.905	3.875	4.172	3.984	3.939	3.887	4.006	3.944
M or F	1 or 2	F	4.101	3.922	4.026	4.016	4.103	4.042	3.999	4.048
M or F	2	M or F	3.837	3.931	4.080	3.949	3.905	3.905	3.916	3.909
M or F	1	M or F	4.169	3.866	4.118	4.051	4.136	4.023	4.089	4.083
M or F	1 or 2	M or F	4.003	3.899	4.099	4.000	4.021	3.964	4.002	3.996

M1M's seem a rather neutral group. In general, they were judged somewhat lower than M1F's but not significantly. They scored significantly less than the latter, however, at the middle spacing on aggressiveness, curiosity, enthusiasm and planfulness.

F. M1F's increased significantly from the close to the middle spacing in aggressiveness, curiosity and number of interests. At the under-two-year sib-age difference the group seemed rather passive. However, on practically all of the positive traits studied, M1F's scored above (not always significantly above, however) the M2F's at the spacings wider than two years, but at the middle spacing the former were rated less in responsibleness. When child and sib were less than two years apart in age, M1F's scored higher in planfulness. The M1F type seemed most on its toes when the sib age gap was two to four years—i.e., here they scored higher than M1M's on aggressiveness, curiosity, enthusiasm and planfulness and higher than F1F's on aggressiveness, curiosity and enthusiasm. The former were rated lower, however, on responsibleness than the latter. The outstanding pattern detail in the case of M1F's is, in our opinion, the change in a positive direction from the close to the middle spacing.

G. F1M's, generally, tended to rate higher than the other groups on most of the traits but the group differences were not always significant. The evaluation of F1M's curiosity was significantly higher than that of the F2M's at all spacings. The former was gauged at the wide spacing the more enthusiastic; at the close spacing, as more given to procrastination and as less responsible. F1M's scored significantly higher than the F1F's at some level on practically all of the traits and rather consistently higher on all of the traits except responsibleness and procrastination. From these observations we suspect that a male sib sparks the girl's drive. The girls with a younger brother received significantly higher ratings in enthusiasm than the boys with a brother their junior. At the close spacing the former group was judged more aggressive and ambitious and at the middle, more ambitious, tenacious and responsible. The group differences at the wide spacing were usually insignificant. The F1M's seem the most dynamic of our groups as far as the traits studied are concerned.

H. The F1F's, in contrast to the F1M's, were a rather average or steady group, changing insignificantly with spacing. They differed little from the F2F's, except at the close spacing, where they received a lower rating on tenaciousness and at the over-four-year spacing, where they were judged to procrastinate the more. The F1F's seemed less on their toes than the F1M's, scoring lower generally, except in procrastination and responsibleness. At one spacing or another F1F's scored significantly lower on aggressiveness, curiosity, enthusiasm, ambition and tenacity. When compared with the M1F's, the former were assessed the more responsible. F1F's were rated more aggressive at the close spacing and at the middle, less curious and enthusiastic.

TABLE 6

ANALYSIS OF THE VARIANCE FOR VARIOUS TRAITS

Source of Variance	df	Aggressiveness			Curiosity			Originality			Number of Interests			Enthusiasm		
		Sum of Squares	Estimate of Variance	F	Sum of Squares	Estimate of Variance	F	Sum of Squares	Estimate of Variance	F	Sum of Squares	Estimate of Variance	F	Sum of Squares	Estimate of Variance	F
Total	383	330.80			309.15			332.19			312.58			313.56		
Between groups	23	22.91	1.00		24.88	1.08		10.20	.44		18.48	.80		34.25	1.49	
Within groups	360	307.89	.86		284.27	.79		321.99	.89		294.10	.82		279.31	.78	
Between replications	15	25.01	1.67		17.06	1.14		13.18	.88		20.72	1.38		12.24	.82	
Residual	345	282.88	.82		267.21	.77		308.81	.90		273.38	.79		267.07	.77	
Between Variables:																
Between sex groups	1	1.61	1.61		.02	.02		.96	.96		.31	.31		3.47	3.47	4.48
Between sibling's-sex groups	1	2.46	2.46		.81	.81		1.32	1.32		1.35	1.35		6.49	6.49	8.39
Between ordinal-position groups	1	.35	.35		7.73	7.73	9.98	.04	.04		.77	.77		1.59	1.59	
Between spacing groups	2	3.14	1.57		3.99	2.00		.18	.09		5.10	2.55	3.22	3.40	1.70	
First-order Interactions:																
Subject's sex—sibling's sex	1	.00	.00		2.57	2.57		.33	.33		.01	.01		2.16	2.16	
Subject's sex—ordinal position	1	.18	.18		.02	.02		.70	.70		.00	.00		.41	.41	
Subject's sex—spacing	2	3.40	1.70		.67	.33		.78	.39		1.96	.98		1.07	.53	
Sibling's sex—ordinal position	1	.06	.06		.19	.19		.02	.02		.32	.32		2.86	2.86	
Sibling's sex—spacing	2	3.09	1.55		.05	.03		2.44	1.22		.61	.31		1.82	.91	
Ordinal position—spacing	2	.19	.09		.18	.09		.21	.11		.62	.31		.94	.47	
Second-order Interactions:																
S's sex—sib's sex—ordinal position	1	2.54	2.54		1.86	1.86		1.04	1.04		3.53	3.53	4.45	4.09	4.09	5.28
S's sex—sib's sex—spacing	2	.65	.33		2.37	1.19		.35	.18		.62	.31		.87	.44	
S's sex—ordinal position—spacing	2	3.72	1.86		.72	.36		.16	.08		.35	.18		2.69	1.35	
Sib's sex—ordinal pos.—spacing	2	1.16	.58		2.85	1.43		.64	.32		2.43	1.22		1.60	.80	
Third-order Interaction:																
S's sex—sib's sex—ord. pos.—spac'g	2	.37	.18		.84	.42		1.02	.51		.49	.25		.77	.38	

TABLE 6 (*continued*)

ANALYSIS OF THE VARIANCE FOR VARIOUS TRAITS

Source of Variance	*df*	Ambition			Responsibleness			Tenacity			Planfulness			Tendency to Dawdle and Procrastinate		
		Sum of Squares	*Estimate of Variance*	*F*	*Sum of Squares*	*Estimate of Variance*	*F*	*Sum of Squares*	*Estimate of Variance*	*F*	*Sum of Squares*	*Estimate of Variance*	*F*	*Sum of Squares*	*Estimate of Variance*	*F*
Total	383	333.93			338.84			349.52			347.36			336.13		
Between groups	23	17.37	.76		29.24	1.27		28.86	1.25		21.23	.92		19.23	.84	
Within groups	360	316.56	.88		309.60	.86		320.66	.89		326.13	.91		316.90	.88	
Between replications	15	20.03	1.34		17.00	1.13		17.10	1.14		29.13	1.94		12.30	.82	
Residual	345	296.53	.86		292.60	.85		303.56	.88		297.00	.86		304.60	.88	
Between Variables:																
Between sex groups	1	2.26	2.26		13.62	13.62	16.06	8.24	8.24	9.36	3.82	3.82	4.44	1.29	1.29	
Between sibling's-sex groups	1	4.83	4.83	5.62	1.12	1.12		4.45	4.45	5.06	.13	.13		1.05	1.05	
Between ordinal-position groups	1	.06	.06		.82	.82		.17	.17		1.08	1.08		2.92	2.92	
Between spacing groups	2	1.15	.58		.45	.22		.43	.21		2.41	1.20		.21	.11	
First-order Interactions:																
Subject's sex—sibling's sex	1	.12	.12		.09	.09		.60	.60		.90	.90		.01	.01	
Subject's sex—ordinal position	1	.08	.08		.10	.10		1.07	1.07		2.14	2.14		4.92	4.92	5.57
Subject's sex—spacing	2	.20	.10		1.25	.62		1.03	.52		.70	.35		.29	.14	
Sibling's sex—ordinal position	1	1.64	1.64		.56	.56		.25	.25		.05	.05		1.29	1.29	
Sibling's sex—spacing	2	1.03	.51		1.14	.57		.66	.33		1.89	.95		.59	.30	
Ordinal position—spacing	2	.36	.18		1.00	.50		1.14	.57		2.59	1.30		.20	.10	
Second-order Interactions:																
S's sex—sib's sex—ordinal position	1	2.30	2.30		1.85	1.85		.23	.23		.94	.94		.28	.28	
S's sex—sib's sex—spacing	2	1.97	.98		2.09	1.05		6.49	3.24	3.69	1.02	.51		.71	.36	
S's sex—ordinal position—spacing	2	1.18	.59		1.71	.86		2.08	1.04		.83	.42		1.64	.82	
Sib's sex—ordinal pos.—spacing	2	.02	.01		.45	.22		1.54	.77		1.15	.58		.83	.42	
Third-order Interaction:																
S's sex—sib's sex—ord. pos.—spac'g	2	.17	.08		3.01	1.50		.49	.25		1.57	.78		3.00	1.50	

Discussion of Results

Spacing- and Sib's-Sex-Group Differences

It seems reasonable to us that number of interests should increase as the age difference between the sibs increases (Item 1). The less alike in age the child and his sib are the more the former is likely to be thrown for companionship with children not in his home. This should extend his interests. Furthermore, in the case of the second-born, the effort of the child to keep up with his older sib (whose interests should be more numerous the older he is) should also expand the former's interests as the sib age difference widens.

That tenacity should be shown to a greater degree by the rivalrous, jealous, competitive aggressive girl with a younger brother (10, 11, 12) than by the girl with a younger sister (Item 2), one might also have predicted. The drive of the F1M's, we think, is sparked by sex rivalry; and the confidence which comes from being the abler member of the sib pair probably also makes for high persistence in effort as well as dominance on F1M's part. Since at the four-to-six-year spacing, when the sib of our five-and-six-year-old subjects would often be a mere infant and not a competitor either in the matter of skills or possessions, nor its sex conspicuous, we might expect, what we found, that the tenacity difference of F1M's and F1F's was insignificant. At the spacings under four years, however, when sib interests overlap considerably, yet the treatment differential between the siblings must be great, and this especially if they differ in sex, sheer persistence may be more rewarding in adjustment than it is when the spacing is wide and contact with the sib very limited. F1M's, who are very jealous of the brother (12)—possibly with good reason because boys tend to be indulged more by their mothers (17)—and expansive in their dealing with the problem, might be expected to be more tenacious than the F1F group.

That the F2M's and F2F's differed only at the two-to-four-year spacing (Item 7) may be due to the possibility the members of the two groups associated to a different degree with their sibs at this level. The phenomenon of sex distance, which is particularly high among grade school youngsters (9), may isolate F2M much from her two-to-four-year-older sib and his associates, while F2F will be functioning chiefly as a much out-classed hanger-on in her sister's play groups. F2M(25-48)'s, having more playmates of their own choosing, are likely to have their confidence, drive and rivalry stimulated by the latter, while F2F(25-48)'s, being chiefly hangers-on still in the sib's groups, feel too inferior to be very tenacious or dominant.

In the case of the second-born boy we seem not to have a similar picture. The forces which make the boy with a much older brother more tenacious than the one with a much older sister (Item 2) we have in a sense discussed elsewhere (12) but let us comment briefly here. (See Items A and B; also Items 2, 4, 6, 8, 10 and 12.) The boy with an older brother

identifies with him and wants to keep up with the latter's standards. His sib reinforces his sex identification and reduces conflict (12). But when the age difference between the child and his older brother is over four years, their play groups overlap little. The brother is out of the home much of the time. Hence M2M does not have the experience of being constantly outclassed and has playmates of his own age, sex and choosing, who bolster his morale, and with whom he can compete as an equal. His mother, furthermore, probably protects him much against his much older brother and his father may also, there being no cross-sex alliances in this case. Hence M2M's experience of being outstripped is not too frequent. This constellation of influences should strengthen M2M(49-72)'s drive, self-confidence and initiative.

M2F, on the other hand, has much sex identification conflict, we believe. The models he has most contact with (his sib and mother) are females. If Freudian theory is correct, his father probably favors the sister. The sib is likely, too, to bar her four-to-six-year younger brother from her play groups, yet she is at home much and is probably often put in charge of the younger brother with whom she is very rivalrous, dominating and possibly even protective (see F1M and also 11, 12). His feeling of inferiority, the greater passivity of the female model he has, his father's likely favoring of the sib, his more frequent association with his sib who beats him down and his mother's indulgence of him because he is a male, the youngest, and different in sex from the older sib, we suspect, curb the drive and tenacity or dominance of M2F. That he is encouraged in a more passive pattern seems likely. He may have compensation for his feelings of inferiority in the indulgence and babying he receives from his mother and others. Hence we would expect, when the sib age gap is wide, M2F would be less tenacious and less dynamic generally than M2M; also that the difference between the two groups would increase as the sib age gap widens. It is to be noted that the boy with a much older brother, compared with one with a much older sister, was judged the more aggressive, enthusiastic, ambitious, tenacious and possessed of the more interests (Items 2, 4, 9 and 12).

It is interesting that M2M's differed insignificantly from M1M's, except that at the widest spacing the boy with the much older brother was judged to be more enthusiastic.

The variable, sex of sib, in relation to sex of child, seems an important conditioner of many of the group differences in personality which we have observed (Items 6 to 10 and A to H). The girl with a younger brother, for instance, apparently stimulated by sex rivalry, presents a picture of greater dynamicness than the girl with a younger sister. At some spacing in the case of practically all of the traits, except responsibleness and procrastination, the assessment the F1M's received was significantly higher than that the F1F's received.

That F1M is so confidently rivalrous and expansive (11, 12) we think arises out of her identification with her mother—possibly also out of attentions from her father—and the fact that, as the older sib, she is the abler. She believes her sex to be the better (1, 20); but, challenged by her brother, she has more need to prove herself "best" than has F1F. The former's younger brother (see M2F), whatever his age, is probably sufficiently favored and indulged by the mother (17 and also Item B) so that she is kept ever alert. That the age difference between F1M and her brother, and the treatment difference this implies, does not alter in a very consistent way the work habit differences between her and the F1F's, suggests it is the sheer fact of the sib's difference in sex and the probable attitude of the mother, etc., associated with this that is important rather than characteristics of the sib other than his sex.

It impresses us that at the two-to-four-year spacing sib's-sex-group differences seem particularly marked (Items 2, 7, 9, 10 and 16). M1F(25-48)'s, for instance, received a higher rating than M1M(25-48)'s in aggressiveness, curiosity, enthusiasm, and planfulness (Items E and F); F1M's exceeded F1F's in curiosity and enthusiasm (Items G and H); F2M's scored higher than F2F's in curiosity, originality, enthusiasm, ambition, responsibleness, tenacity, and lower in procrastination (Items C and D). The exception to the trend of greater apparent drive in the child at the middle spacing whose sib is opposite in sex is the boy with an older sister, who either differs insignificantly from the boy with an older brother or in the depressed direction. We have already discussed the case of M2F and attributed his passivity probably to the excessive babying he receives from his mother, the dominance of his jealous older sister and his sex identification conflict.

The forces which motivate the first-born whose sib is two to four years younger, we think, may assume a pattern such as the following: Since our subjects were five- and six-year-olds, the sib would be at that adorable one-to-four-year age, when it receives much attention and appreciation from the family and others. Yet it is not too satisfying a companion for the older child because of its immaturity. It gets around on its own and in its clumsy way may interfere much with the activities and possessions of the latter.

Some would want to put more emphasis on the *time* in the older child's life of the arrival of the sib, or when the latter becomes a competitor, and this in relation to the possibility of serious interference with the former's dependency needs at a critical stage in its development. Stendler (19) has the belief, for instance, that the child from nine months to three years is particularly susceptible to trauma with persisting effects. Evidence is accumulating that the effects of trauma occurring in an individual with very restricted experience tend to be very durable.

If the sib is opposite in sex, the treatment differential will be greater than if the sib is of the same sex as the child and this differential will probably be great at the middle spacing and perhaps seem to the child less justified than would be the case were the sib much older or younger. The sex of a very young sib will not be an important determinant of differences in sib treatment, and if the sib is very near the older child in age, a low difference in treatment of the two children probably obtains as well, parents tending to interfere less in the sib altercations if there is a chance of the children settling matters by themselves. Parents will need to interfere most at the middle spacing and in doing this will doubtless reveal their sex bias, or the child, looking for reasons for a difference in treatment, will see this difference as due to his sex difference. The high jealousy of M1F(25-48)'s (11), we believe, may lie back of his higher score in curiosity, aggressiveness and planfulness (Item 7). We also have the hunch that at the middle spacing the sex difference between the sibs makes the most difference in the degree to which the child has associates of his own sex, age and selection, a condition which we suspect makes for greater expansiveness and a more dynamic attitude on the part of the subject. If the sib is an infant or very much older, the great maturity difference between the sibs throws the child with associates of his own, no matter what the sex of his sib. On the other hand, should the sib be very near in age, then he will tend to have the same playmates—i.e., a sex difference will probably not be an important factor in assuring the child associates of his own. However, when the age difference is two to four years, the maturity difference between the sibs, in addition to a sex difference, may separate some the sibs opposite in sex, whereas the maturity difference alone would not. In other words, we think it takes a larger maturity difference to separate the sibs substantially, if it operates alone.

A child two to four years younger than his sib and of the same sex is likely to have the role of a hanger-on in groups chosen chiefly by the latter, whereas, if the child differs in sex from his sib, he is more likely to have playmates of his own selection, a condition which we think builds his confidence, bolsters his morale, makes him stand on his own feet and encourages him to be socially more expansive. As we have said, the fact that M2F does not seem to fit this pattern may be due to his being indulged and protected excessively by his mother—possibly even by his older sister as well—and kept apart. There is some evidence the mother babies him, encourages dependence and creates a state of mind unfavorable to interest in peers (12). M2M at the widest spacing, when we would expect him to have a coterie of friends of his own and to be encouraged in the masculine pattern, is, in contrast, buoyant. At the middle spacing when M2M is still chiefly a hanger-on, he tends to be rather ineffective, resembling F2F, who at this spacing would be in a similar role. M2M's

and F2F's at the two-to-four-year sib-age-difference level were, one or the other, rated significantly lower in curiosity, enthusiasm, ambition, tenacity, than the corresponding group at the widest spacing.

If the sib is younger, the sex distance factor (9), we believe, will operate less potently because both children will be at home most of the time and playmate groups will overlap. Should the sib be an infant, however, it will not be much of a participant in the older child's play and the latter's playmates will be chiefly of his own choosing. But we feel sure the sex distance factor does operate some at the middle spacing. The boy and his friends may be thought too rough by the one-to-four-year sister, for instance, and she may seek associates of her own sex. If the sibs' age disparity is less than two years, their play groups will doubtless overlap much or be virtually identical.

We suspect, then, the greater aggressiveness, curiosity, enthusiasm and planfulness of M1F(25-48) than M1M(25-48) (Items 7, 12, E and F) is related in part to his having a coterie of friends of his own and his rivalrousness due to the adoration the sib receives, which is unique to the latter's age.

The greater drive or tension generally of F1M than F1F (Items G and H and 2, 6, 7, 8, 9 and 12) probably demands some comment. It is our belief the first-born girl identifies strongly with her mother. This should give the former considerable confidence about her sex classification but she is at the age when typically girls become increasingly interested in their fathers and in sex roles. Hence it is our hunch the girl is less likely to question her own worth if her sib is of her own sex. Should the sib be different, the girl may have to prove to herself and others she is the better. If the sib is male, she may sense vaguely the mother's favoring of the brother (Freudian doctrine maintains the latter is the usual tendency) and even the premium placed by the culture on the male. Against doubt the girl is likely to react vigorously and, in the main, by reaching out. F1M tends to be more aggressive, curious, enthusiastic, tenacious than F1F, for instance. The activeness, hostility and vigor of the brother may be another determinant of F1M's reaction pattern but this could scarcely be very potent at the wider spacings.

F2M reacts somewhat less vigorously than F1M, we suspect, because she is outclassed by her older brother from the first and she has not experienced being superseded by her sib. Many would insist F1M's drive is somewhat anxiety motivated, because of the displacement experience and possibly anxiety contamination from her inexperienced parents whose first child she was. Hence F2M would be viewed as more relaxed than F1M rather than less dynamic. It is possible F1M may have been given more responsibility and been stimulated more than F2M, the latter remaining the youngest in the family, since we dealt only with two-children families. What interests us is that if the latter forces listed are very potent, they

should produce ordinal-position differences in all the groups. These differences seem to show, however, only in the case of the F1M's and M1F's—a fact which suggests that considerable weight should be given to the idea that the first born, who is particularly status-sensitive, has his drive fed very significantly by sex rivalry.

We have noted that those with a male sib were judged more ambitious, on the average, than those with a female sib (Item 9). If we look closely at the tables, however, we see that M1M presents an exception to this trend and that only the girls with a brother and M2M at the wider spacings fit the pattern. Hence we suspect it is not the mere maleness of the sib that is the potent mechanism in these results. The girl with a brother, as has been mentioned earlier, it is our belief, is jealous and is spurred by sex rivalry. This could make her more ambitious than the girl with a sister, as well as more enthusiastic and aggressive. That M2M is more ambitious than M2F at the wider spacings we suspect results from forces quite other than direct sex rivalry. As has been explained, M2F probably suffers seriously from a sex identification problem but seems to deal with it rather passively, getting some compensation for this possibly from the indulgence of his mother and even of his older sister. Instead of having his drive increased by sex rivalry, it is our hunch, he is depressed and withdraws. In this latter he may be somewhat encouraged by his indulgent mother. He may also be too indulged to be able to tolerate the buffets of his peers. He ranks low in ambition, enthusiasm and initiative. Back of the trend in all three traits we think we see the evidence of the same set of influences (see also Items 4, 6, 8, 10 and 12).

Ordinal-Position Group Differences

It is interesting first-borns tended to be judged more curious than second-borns (Item 4). This may be due to the fact the former have associated more with adults, who have aroused their interests in many things and encouraged their questions. If this were the mechanism, we should expect curiosity to increase with spacing both for first- and second-borns. This is, to be sure, the trend but the spacing-group differences are not significant.

It is also possible that curiosity is greatest when the child is on the *qui vive*. The first-born, because he has been displaced, is the more concerned about his rights and status. Our evidence that the older member of the pair tends to be the more competitive and insistent on his rights (12) gives the hypothesis some support. It is relevant, too, that among the first-borns, those in opposite-sex pairs, where the sib's threat to status is greatest, showed the most curiosity (Item 7).

First-borns at the close spacing were rated more planful, too, than second-borns. The former, when the sib follows close on his heels, does not long have the experience of being the sole object of parental concern. The second-born, in our two-child families at least, remained, on the other

hand, the youngest and hence probably longer had the type of service and protection we are wont to call "babying." Responsibility is put on to the shoulders of the first-born sooner, we think. All this should encourage him in being planful. Since his competitor is formidable, too, if the spacing is close, he can maintain the top position only if he plans carefully and looks ahead. Planfulness may hence be very rewarding. We have the hunch, too, that the first-born tends to be contaminated by his parents' caution and uncertainty in their new role as parents. Fearfulness motivates planning, looking ahead, and makes for restraint and curbing of impulsiveness. That the first-born was judged the more planful only when his sib differed little in age we suspect may result from influences at the wider sib spacings which counter to some extent those just described as favoring the older child. The first-born, for instance, who was long an only child might have had the initiative in planning kept from him for a sufficient time to weaken his inclination.

It did not surprise us when scanning ordinal-position differences that first-born girls were thought to dawdle more than second-born. Procrastination and dawdling may be one of the less aggressive ways of luring to the self the longed-for service and support. The first-born girl among our subjects has functioned as an only child for from nine months to six years. She has had her parents' attention undiluted and has probably come to be more dependent on it than the second-born who has always had to share attention and service. But what we find puzzling, if our hunch is correct, is that first-born boys were not rated higher in procrastination and dawdling than second-borns. Since girls probably are indulged less (17), and when they are the older sib are given much responsibility relatively, they may have more need to use dawdling as an attention- and service-getting device than the boy. Girls also would tend to favor the more passive kinds of adjustment of which dawdling is one. We note, however, when we scan the data in detail, that it is M2F, who we think is pampered, passive, and possibly inferior-feeling, who ranks highest in dawdling. He doubtless uses dawdling as a device to keep adults at his service, and his mother, being indulgent, probably rewards his efforts. His weight doubtless causes the second-born boys to average as high as the generally more susceptible first-borns.

Sex-Group Differences

The sex differences our data show tend to be in line with those reported in the literature. The girl was judged by her teachers as more responsible, planful and persistent. This finding is congruent with the usual finding that the girl is more obedient, conscientious, and conforming than is the boy. (See References 2, 3, 6, 11, 16 and 20 as examples.) What the relative weights of cultural and biological forces are in determining the difference is, of course, a question.

When the sib was less than two years younger, first-born girls were judged to have more initiative or be more dominant than boys. Since girls are more conforming than boys, the former are probably given more responsibility (17) and are hence also more comfortable at school than is the boy. This may cause the girl to take more initiative, especially in school activities. It was school behavior, we should remind the reader, on which the teachers' ratings were chiefly based. It is also possible that the girl's identification with her mother, and through generalization, with her teacher, that causes her to show more initiative at school. But why, then, would the sex difference obtain only at the close spacing? We think it possible the arrival of a sib close on his heels may traumatize the boy more than the girl since he cannot identify completely with his mother. Threatened more, he may adapt by direct vigorous clinging to his mother whereas the girl may reach out more. It is interesting in connection with this hypothesis that the boys who we think have the least in the way of a sex identification problem—namely, the MM's at the widest spacing—were rated particularly high in initiative. The hunch that the girl at the close spacing is more self-confident than the boy is given support by the teachers' ratings on this trait. Significant also are Tuddenham's (20) and Ausubel's (1) findings which suggest that young girls tend to have a better opinion of themselves than do young boys.

Second-born boys were thought to dawdle more than girls. This may be the result of the mother's greater indulgence of the male and the males' lesser comfort at school. Just why, then, first-born boys were not judged to procrastinate more than the girls is not clear. Possibly the sex differential in indulgence is greater among second- than first-borns.

As a final comment let us point to the sib's-sex variable as a very important one that, in the main, has been relatively neglected in the experimental, though not in the clinical literature. We have been impressed also by the fact that most of the significant relations in our data appear in the interactions. This would justify warning against sweeping generalizations about the effects of birth-order, sib's sex, sex of child or the age difference between sibs.

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THE EFFECT OF VERBAL TRAINING ON INITIAL GENERALIZATION TENDENCIES

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It has often been observed that *Ss* who learn a given response to a stimulus tend to generalize it to other stimuli which are physically similar to it. The amount of generalization decreases as the similarity between training and test stimuli decreases. This has been called primary generalization.

There are, however, other bases for generalization. Birge (1), Jeffrey (4), Murdock (5), Eisman (3) and Shipley (6) have all demonstrated that learning a common response for two or more stimuli increases the tendency to generalize other responses among them. This is known as mediated or secondary generalization.

In these studies, however, not much attention has been paid to the nature of the stimuli involved and so a question is raised as to whether or not there is a relationship between the similarity of the stimuli and the effectiveness of a mediating response. Concretely one might ask, "When *Ss* are taught a common response to two highly dissimilar stimuli, is the tendency to generalize other responses between these stimuli raised to the same level as when *Ss* are taught a common response to two less dissimilar stimuli?"

The present study is a beginning attempt to answer this question. It is concerned with getting an indication as to whether or not a relationship exists between stimulus similarity and the effectiveness of a mediating response. To do this, a training stimulus and a series of test stimuli of increasing dissimilarity from it were used. An attempt was made to determine first the initial or primary generalization gradient and then to see how the gradient would be affected by teaching *Ss* a common name for the training stimulus and each of the test stimuli. It was predicted that such training would increase the amount of generalization at all test points, but no prediction was made as to the amount of increase that would be observed at each point.

SUBJECTS

Fifty-nine children from the Iowa Preschool laboratories and the Parent's Playschool in Iowa City were used as subjects. All were between the ages of 3½ and 6 years at the time of participation.

Apparatus

The apparatus was a rectangular black box 14½ in. wide, 17½ in. high and 10½ in. deep. A circular flashed opal glass opening 4 in. in diameter was located in the upper center front of the box. Inside the box, behind the aperture, was a set of wooden compartments each containing a 75-watt projector lamp. It was possible to insert colored glass filters into grooves in front of these bulbs and thus project a colored light onto the glass in the aperture. A series of such lights could be presented manually by operating a push button or automatically through the activation of a stepping relay by two Hunter Timers.

There was also a small push button set in a wooden block which was placed on the table between *S* and the apparatus. Pressure on this button constituted the response measure.

Stimuli

Five 2 by 2 in. colored glass filters manufactured by the Corning Glass works were used as stimuli. They were a red, No. 2030, a reddish orange, No. 2418, an orange, No. 3480, a yellow, No. 3307 and a blue, No. 5030. Six staff members and graduate students at the Child Welfare Research Station judged that the stimuli as listed above constituted a series of decreasing similarity from the red.

Procedure

The *S*s were randomly divided into three experimental groups of 18 each and one control group of five. Each experimental group was tested twice for its tendency to generalize the button pushing response from the training stimulus to one of the test stimuli. The first test was given before *S* learned a common name for the training and test stimuli. The second test was given afterwards. The control group was also given two generalization tests, using the third test point, but members of this group had no intervening verbal training.

Each *S* was brought into a darkened experimental room and seated at a small table. Directly in front of him was the push button. About 18 in. behind that was the main apparatus with the aperture slightly above eye level.

Stage 1 for all *S*s consisted of 24 random presentations of the red and blue stimuli. *S*s were taught to push the button when the red light came on and not to push it when the blue light came on. *E* gave verbal reinforcement, "Right," or punishment, "Wrong," after each response throughout this stage.

Stage 2 for all *Ss* was an initial generalization test. Three presentations of the appropriate test stimulus for each group were randomly interspersed among the red and blue stimuli in a series of 12 presentations. No reinforcement for any response was given during this series. During both Stages 1 and 2 the lights were automatically presented with a 4-second intra- and inter-presentation interval.

Stage 3 was given to all experimental groups, but omitted for the control group. *Ss* were given 24 presentations during which the red, blue and test stimuli were randomly interspersed. They were taught the name "Mo" for the red and the test stimuli and the name "Lee" for the blue stimulus. Then there was a rest period during which *Ss* were allowed to choose from among a group of dime store items the "prize" they wished to win when the session was over. After the rest, they were again given the three light series and asked for the name each time. Control *Ss* were merely given the rest period and allowed to choose their prizes.

Stage 4 for the experimental groups consisted of 10 random presentations of the red and blue lights. *Ss* were required to say the name of each light as soon as it came on and then to push the button for red and not to push for blue. As in Stage 1, verbal reinforcement was given throughout. Control group subjects were given these 10 presentations but were not, of course, required to say any names.

Stage 5, the final generalization test, was given to all subjects and duplicated Stage 2, except that experimental subjects were required to say the name of each light as it came on. During Stages 4 and 5 the lights were automatically presented. They were on for six seconds and off for four. The increase in the amount of time the lights were on was necessary to allow the experimental groups time to verbalize the names.

Results and Discussion

The results are given in Table 1 and are graphically represented in Figure 1. Table 1 shows the proportion of pushing responses made to each stimulus on both the initial and final generalization tests. These figures represent the number of times the pushing response was made to each stimulus divided by the number of times that stimulus was presented. Figure 1 shows the mean number of generalized pushing responses made to each of the test points both before and after verbal training. It was necessary to use proportions in Table 1 since the number of times the red and blue stimuli were presented differed from the number of times the test stimuli were presented. Figure 1, however, deals only with the test points, each of which was presented an equal number of times; thus means are used in presenting the data. It is immediately apparent from both the table and the figure that, in terms of observed results, the prediction was confirmed. At every test point there was more generalization after than

TABLE 1

PROPORTION OF PUSHING RESPONSES MADE TO EACH STIMULUS BY ALL GROUPS ON INITIAL AND FINAL GENERALIZATION TESTS

	Red	*Blue*	*Test Point 1*	*Test Point 2*	*Test Point 3*
Initial Test					
Experimental Groups	.98	.01	.80	.24	.22
Control Group	.96	.00	..	..	.33
Final Test					
Experimental Groups	.97	.03	.91	.44	.65
Control Group	1.00	.00	..	..	.33

before verbal training. The control group which received no verbal training showed no change at all.

In view of the extreme skewness of the data at each point, Dixon and Mood's nonparametric Sign Test (2) was used to test for statistical significance. For each experimental group the amount of generalization before and after verbal training was compared. *Ss* tested at point 1 showed no significant increase. *Ss* tested at points 2 and 3 did show significant in-

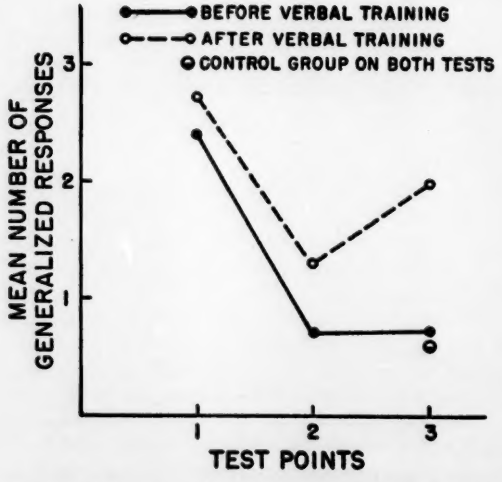

FIGURE 1—Mean number of generalized responses at each test point.

creases with the respective probabilities of occurrence being 5 per cent and .05 per cent. It seems likely that the failure to find a significant increase at point 1 can be attributed to a ceiling effect. *Ss* tested at this point had such strong generalization tendencies initially that there was little opportunity to demonstrate an increase. In view of the small *N* in the control group, no test of significance was made. It is noteworthy, however, that not one of the *Ss* in this group changed at all from the first to the second test indicating that mere continued exposure to a set of stimuli will not, per se, result in increased generalization.

The notion of mediated generalization has been commonly used to explain generalization increases of the type found in this study. According to this view, the mediating response, in this case the name "Mo," itself produces a stimulus which occurs in conjunction with each of the external stimuli to which it has been conditioned. The presence of this common response-produced cue in two (or more) stimulus complexes is said to make these complexes more similar to each other than are the external stimuli alone and hence there is more tendency to generalize among them. It follows then that the optimum situation for demonstrating mediated generalization is one in which *Ss* are forced to make the mediating response overtly during the generalization test, thus maximizing the probability that the response-produced cue will be present. These conditions were met in this study. Nevertheless, about half the *Ss* in each group showed no increase in generalization from initial to final test. A possible explanation for this lies in the operation of competing and incompatible response tendencies. Almost all the *Ss* who showed no increase were those who showed no generalization at all during the initial test. It appeared that during that test they formulated for themselves the principle that one should not pull to the test light. Many, in fact, verbalized this principle. Subsequent presentations of the test light during the final test elicited both the principle and the mediating response. Apparently the tendency to react to the principle was stronger than the tendency to react in accordance with the stimulation provided by the mediating response.

Viewed as a whole, however, the study provides at least a tentative answer to the question raised in the introduction and suggests the direction in which future research should go. Figure 1 indicates that the teaching of a common response, in this case the word "Mo," to the training stimulus and stimuli of decreasing similarity from it did raise generalization tendencies at all points. However, it is noteworthy that neither of the two furthest points was raised to the level of the nearest point indicating that there is a relationship between the similarity of two stimuli and the effectiveness of a mediating response. Unfortunately, with the present data it was impossible to make a precise statistical test of this observed interaction between training and test point. A future study using more tests at each point and instructions designed to minimize the buildup of interfering response ten-

dencies should yield data amenable to such analysis. Moreover, since these data do tentatively indicate the presence of the sought after relationship, it would now seem worthwhile to try to discover the precise nature of this relationship. Accordingly, future studies should use stimuli whose similarity to each other can be precisely indicated in j.n.d. units. Also, it would be worthwhile to extend the range of similarity beyond that utilized in this exploratory study in order to determine if a certain minimum amount of similarity is necessary before mediated generalization can be demonstrated.

Summary

Three groups of preschool children were tested for their tendency to generalize a button pushing response from a red light to a reddish orange, an orange and a yellow respectively. One test was given before learning a common name for the training and test stimuli. One test was given afterwards. An increase in generalization following verbal training was observed at all points. The results were discussed in terms of the principle of mediated generalization.

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THE CHILDREN'S FORM OF THE MANIFEST ANXIETY SCALE

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In 1951 Taylor (37) published the results of an experiment in which the performance of adults in a classical conditioning situation was found to be related to their scores on a questionnaire relating to anxiety. The questionnaire, now more familiarly known as the Taylor scale of manifest anxiety, was subsequently published (38) with a description of the history of its development and stardardization data. Since then the performance of adults scoring high and low on the scale has been studied in classical conditioning (3, 22, 29, 32, 34, 35, 36, 37), differential conditioning (11, 31, 33), verbal paired associate learning (27), serial anticipation learning (14, 16, 18, 19, 23, 39), motor learning (26, 40), perception (4), maze learning (8, 21), simple and complex reaction time tasks (10, 24, 41) and stimulus generalization (6, 28). In addition, the effects of anxiety have been studied in conjunction with stress (5, 6, 18, 25, 42), failure (19, 26), electric shock (34), incentives (22) and mental set (20). Its relationship to other indices of anxiety, behavior disorders, intelligence, etc., has also been extensively studied (1, 2, 7, 9, 12, 13, 15, 17, 42). A number of these studies have served as the empirical component upon which Spence (30) has based his attempt to clarify the role of motivation in simple and complex learning situations.

In the interest of extending the generality and continued usefulness of this scale over a wider range of different populations, the present study

[1] The authors wish to express their thanks and gratitude for the cooperation and assistance received from the following persons: Buford W. Garner, Iowa City Superintendent of Schools; David K. Stewart, Elementary School Curriculum Coordinator; Sylvella Jacobsen, School Psychologist; Donald L. Seavy, Principal, Longfellow School; Margaret Schindhelm, Principal, Henry Sabin School; Albert D. Hensleigh, Principal, Horace Mann School; and Gertrude Smith, Principal, Herbert Hoover School.

reports the description of and the normative data obtained with a scale of manifest anxiety adapted from Taylor's adult form for use with fourth, fifth and sixth grade children.

An earlier version of the present scale was administered to approximately 60 subjects for the purposes of obtaining information regarding possible difficulties in the instructions for its administration and the comprehensibility of the items. A total of 42 anxiety items were selected and modified, and 11 additional items designed to provide an index of the subject's tendency to falsify his responses to the anxiety items were included in the present form of the test. A similar set of items was included by Taylor from the L scale of the MMPI for the same purpose; hence these 11 items will also be referred to as the L scale. All of these items were then submitted to two elementary school system officials for a final check on their comprehensibility for the population for which they were intended. The 42 anxiety items, constituting the anxiety scale of the present test, are reproduced below with their appropriate ordinal numbers as they appear in the present form of the test. The index of the level of anxiety is obtained by summing the number of these items answered "Yes."

1. It is hard for me to keep my mind on anything.
2. I get nervous when someone watches me work.
3. I feel I have to be best in everything.
4. I blush easily.
6. I notice my heart beats very fast sometimes.
7. At times I feel like shouting.
8. I wish I could be very far from here.
9. Others seem to do things easier than I can.
11. I am secretly afraid of a lot of things.
12. I feel that others do not like the way I do things.
13. I feel alone even when there are people around me.
14. I have trouble making up my mind.
15. I get nervous when things do not go the right way for me.
16. I worry most of the time.
18. I worry about what my parents will say to me.
19. Often I have trouble getting my breath.
20. I get angry easily.
22. My hands feel sweaty.
23. I have to go to the toilet more than most people.
24. Other children are happier than I.
25. I worry about what other people think about me.
26. I have trouble swallowing.
27. I have worried about things that did not really make any difference later.
28. My feelings get hurt easily.
29. I worry about doing the right things.
31. I worry about what is going to happen.
32. It is hard for me to go to sleep at night.
33. I worry about how well I am doing in school.
35. My feelings get hurt easily when I am scolded.
37. I often get lonesome when I am with people.
38. I feel someone will tell me I do things the wrong way.

39. I am afraid of the dark.
40. It is hard for me to keep my mind on my school work.
42. Often I feel sick in my stomach.
43. I worry when I go to bed at night.
44. I often do things I wish I had never done.
45. I get headaches.
46. I often worry about what could happen to my parents.
48. I get tired easily.
50. I have bad dreams.
51. I am nervous.
53. I often worry about something bad happening to me.

The 11 L scale items are reproduced below with their appropriate ordinal numbers as they appear in the present form of the test. Items 10 and 49, if answered "No," contribute to the L scale score as do the remaining nine items if answered "Yes." The index of the subject's tendency to falsify his responses to the anxiety items, then, is the sum of these items answered in the designated manner.

5. I like everyone I know.
10. I would rather win than lose in a game.
17. I am always kind.
21. I always have good manners.
30. I am always good.
34. I am always nice to everyone.
36. I tell the truth every single time.
41. I never get angry.
47. I never say things I shouldn't.
49. It is good to get high grades in school.
52. I never lie.

Copies of this test were distributed to the classroom teacher who administered it to her class on a group basis. The only instructions provided the teacher were those which appeared on the test itself and which she read to the class. The instructions were: "Read each question carefully. Put a circle around the word YES if you think it is true about you. Put a circle around the word NO if you think it is not true about you." Space was provided on the test sheet for the subject to identify himself by name, grade, sex and school. Approximately one week later the classroom teacher readministered the test. A total of 15 classrooms from four different schools participated in the study. A total of 386 children participated in the first administration of the test. However, due primarily to absences, only 361 of these children were tested on the second administration.

Anxiety Scale Results

Table 1 presents, by sex as well as by grade, the descriptive statistics for the anxiety scale alone, based on the data obtained on the first administration of the test. A general tendency can be noted for the girls to receive

TABLE 1

ANXIETY SCALE MEANS AND *SD*'S FOR THE DIFFERENT GRADE LEVELS AND FOR BOYS AND GIRLS SEPARATELY

	Fourth Grade			Fifth Grade			Sixth Grade		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Boys	58	14.97	7.82	71	16.24	7.43	73	16.58	7.39
Girls	62	19.09	7.63	68	17.75	9.23	54	18.50	7.82

higher scores. The results of an analysis of variance performed on these data indicated that the effects of sex were significant at beyond the .005 level, i.e., girls gave significantly more "Yes" responses in comparison with boys. The effects of grade and the interaction between sex and grade were not significant. Plots of the distributions for boys and girls separately revealed them to be highly comparable with the exception of a tendency for the girls' distribution to be somewhat less positively skewed. For the present purposes, however, it seemed sufficient to present only a single distribution based on the scores for both the boys and the girls. This distribution is presented in Figure 1.

Inspection of this distribution reveals a slight positive skew and its general form is comparable to that obtained by Taylor with the adult form of the scale with over 1900 college students. The 50th percentile of the

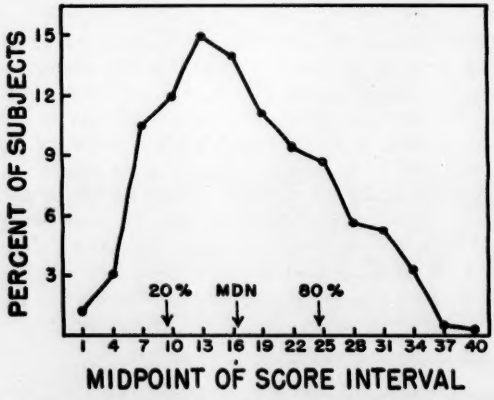

FIGURE 1—Frequency polygon showing percentage of 386 4th, 5th and 6th grade children receiving the indicated scores on the Children's Form of the Manifest Anxiety Scale

TABLE 2

ANXIETY SCALE RETEST CORRELATIONS FOR THE DIFFERENT GRADE LEVELS AND FOR BOYS AND GIRLS SEPARATELY

	Fourth Grade		Fifth Grade		Sixth Grade	
	N	*r*	*N*	*r*	*N*	*r*
Boys	56	.88	68	.91	65	.82
Girls	61	.70	62	.94	49	.89

distribution falls at about 16, the 80th at about 25 and at about 10 for the 20th percentile. The mean of the distribution is 17.16. When the distributions were plotted for the girls alone the 50th percentile fell at about 18, the 80th at about 27 and at about 11 for the 20th percentile. For the boys these percentiles fell respectively at about 15, 24 and 9. The mean of the distribution for the girls was 18.45 and 15.87 for the boys.

A general picture of the consistency of the anxiety scale as a function of sex as well as grade can be obtained from Table 2. All correlation coefficients (Pearson product-moment) are significant at well beyond the .01 level indicating that the relative position of the subject in his group tended to remain constant over the one-week period.

TABLE 3

L SCALE MEANS AND *SD*'S FOR THE DIFFERENT GRADE LEVELS AND FOR BOYS AND GIRLS SEPARATELY

	Fourth Grade			Fifth Grade			Sixth Grade		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Boys	43	2.44	1.96	71	1.94	1.97	73	1.84	1.63
Girls	52	2.54	2.01	68	3.07	2.27	54	1.81	1.76

L SCALE RESULTS

Table 3 presents, by grade as well as by sex, the descriptive statistics for the L scale based on the data obtained on the first administration of the test.[2] As with the anxiety scale, a general tendency is again noted for girls to receive higher scores in comparison with boys. Also, there is an apparent tendency for the sixth grade to score lower in comparison with either the fourth or fifth grades. The results of an analysis of variance performed

[2] One fifth-grade classroom of 33 was omitted from this and subsequent analyses involving the L scale when it was discovered that additional and misleading instructions had been given regarding the L scale items.

TABLE 4

L SCALE RETEST CORRELATIONS FOR THE DIFFERENT GRADE LEVELS AND FOR BOYS AND GIRLS SEPARATELY

	Fourth Grade		Fifth Grade		Sixth Grade	
	N	*r*	*N*	*r*	*N*	*r*
Boys	41	.75	68	.69	65	.53
Girls	51	.72	62	.85	49	.61

on these data indicated that the effects of sex were significant at the .025 level and those of grade at the .01 level. The interaction between sex and grade was not significant.

Table 4 provides a general picture of the consistency of the L scale for boys and girls separately as well as for the three different grade levels. All correlations, as with the anxiety scale, are significant at beyond the .01 level. However, in comparison with the anxiety scale, they tend to be somewhat lower on the average. This difference in the magnitude of the correlations undoubtedly reflects the difference in the number of items comprising the two scales.

RELATIONSHIP BETWEEN THE TWO SCALES

Assuming that the tendency, as reflected in the L scale, for any given subject to falsify his responses to the anxiety items could result in a high anxiety score as well as a low one, correlations of a low order between the two scales would be highly desirable.

Table 5 represents the correlations between the two scales, again for the different grade levels and for boys and girls separately. All of these correlation coefficients fail to attain statistical significance and it can be readily noted that with the exception of the correlation for the sixth grade girls they tend to cluster around the zero value.

TABLE 5

CORRELATIONS BETWEEN THE ANXIETY SCALE AND L SCALE FOR THE DIFFERENT GRADE LEVELS AND FOR BOYS AND GIRLS SEPARATELY

	Fourth Grade		Fifth Grade		Sixth Grade	
	N	*r*	*N*	*r*	*N*	*r*
Boys	41	—.04	68	.03	65	—.10
Girls	51	—.01	62	—.11	49	.22

Contributions to the specification of some of the functional properties currently ascribed to anxiety have stemmed from the theoretical and experimental work of a number of psychologists, particularly Mowrer, Hull and Spence. In current behavior theory these properties are those which define drive states. Hence, as it has been explicitly assumed for the adult form of the anxiety scale, the present scale provides a method for measuring the level of drive with the immediate purpose of attempting to determine its role as a determinant of performance in children.

Summary

The present study reports the description of and the normative data obtained with a scale of manifest anxiety adapted from Taylor's adult form for use with fourth, fifth and sixth grade children. A 42-item anxiety scale and an 11-item L scale are described. One-week retest reliabilities averaged at about .90 for the anxiety scale and at about .70 for the L scale. Intercorrelations between the anxiety scale and the L scale clustered around the zero value. Girls were found to score significantly higher than boys on both scales. Significant differences on the L scale were found to be associated with grade.

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COMPLEX LEARNING AND PERFORMANCE AS A FUNCTION OF ANXIETY IN CHILDREN AND TASK DIFFICULTY

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Within the last few years a number of experiments by Spence (7, 8), Farber (3), Taylor (9, 11) and Montague (5) have attempted to compare the performance of adult anxious and nonanxious *Ss* in classical conditioning as well as in more complex forms of learning situations. The presence of anxiety in these *Ss* had been defined in terms of their responses on a personality inventory of manifest anxiety developed by Taylor (10). *Ss* receiving high scores on this test characteristically exhibit a higher level of performance in the conditioning situation than those receiving low scores. These results have been interpreted to support the assumption that these scores are an index of *S*'s readiness to respond or excitability, which in turn is assumed to reflect their general drive level. Reasoning on the basis of Hull's (4) theoretical formulation relating response strength to drive, i.e., that all habit tendencies aroused by the stimulus situation are multiplied by the total effective drive level then operating, two opposing, though not contradictory, expectations have been derived by Spence and his associates (6) regarding the role of anxiety as a determinant of performance. If, as in classical conditioning, there tends to be but a single or highly dominant response tendency, an increase in the strength of drive should enhance the strength of that response thereby benefiting performance (3, 7, 8, 9). In situations where there is greater likelihood that more than one response tendency is aroused by the stimulus situation, as in complex learning tasks, whether or not an increase in the drive level will aid or impede performance depends on whether or not the criterion (correct) response tendency is stronger (dominant) in relation to other competing tendencies aroused by the stimulus situation. If the correct response tendency is the

CHILD DEVELOPMENT, Vol. 27, No. 3 (September, 1956)

stronger, performance should be aided by an increase in the drive level. However, should the incorrect response tendency be stronger, the effects of heightened drive should be deleterious to performance. Empirical support for these expectations has also been found in studies dealing with more complex forms of learning in which the Taylor scale has been used as the empirical variable assumed to reflect differences in drive level (3, 5, 11).

The present study is concerned with the performance of fifth grade children on a complex learning task as a function of the relative difficulty of the various components comprising the task and of their scores on a scale of manifest anxiety adapted for children from Taylor's adult form.

Method

Subjects

The 37 *S*s in the present study were from among those who participated in the standardization of the children's form of the anxiety scale (1) and who, in addition, participated in a complex learning experiment (2) a year previously. The present study, then, reports the relationship between the anxiety scale scores of these *S*s and their performance in the experiment of the previous year. Although the conventional practice with the adult form is to select *S*s whose scores fall within the upper or lower 20th percentiles of the distribution, the small number of *S*s available in the present study precluded such a procedure. The anxiety scores of the present *S*s ranged from a low of three to a high of 33; hence a score of 18 or above was arbitrarily designated as falling in the high anxious category and a score of 17 or below in the low anxious category. The high anxious group, then, consisted of 21 *S*s, 9 boys and 12 girls, and the low anxious group was composed of 16 *S*s, 6 boys and 10 girls. In addition, the L scale, i.e., that part of the present form of the test assumed to provide an index of *S*'s tendency to falsify his responses to the anxiety items, was not employed. Preliminary analyses based on the L scale indicated that its use would not have appreciably affected the results. In addition, the loss in the number of subjects resulting from designating a criterion of a score of three or less on the L scale would have resulted in a loss of approximately 30 per cent of the subjects from the present sample.

Apparatus

Since a more detailed description of the apparatus may be found in (2), only a brief description of it will be presented here. In essence, it consisted of a rectangular shaped box approximately 9 by 18 by 9 in., painted flat black. A response panel containing five linearly arranged push buttons projected from the box. Centered 3 in. above the response panel was a 1 in. diameter aperture of flashed opal glass. Behind the aperture were five pilot lamps colored either dark red, green, amber, blue or light red. All

controls used by *E* were situated at the back of the apparatus. By a simple switching arrangement, *E* could actuate any single light and set any single push button so that depressing it turned off the light. Depression of any other of the four remaining buttons did not affect the light.

Procedure

All *Ss* had to learn the same five light button combinations. These five combinations had been previously determined on a random basis. Each single light was presented five times and randomly interspersed within the total 25 presentations. All *Ss* were allowed to continue responding until the correct button had been depressed, at which time the next light was presented. *Ss* were merely instructed that the task required learning which buttons were associated with which colored lights and in case of an error to select another button until the correct one had been depressed. The particular buttons depressed and the order in which they were depressed for each presentation were recorded for each *S*.

Results and Discussion

Studies with the adult form of the anxiety scale have indicated that the differential performance of high and low anxious *Ss* can differ depending on the particular characteristics of the task. For example, the tendency for the high anxious *Ss* to perform more poorly in comparison to low anxious *Ss* increases as the difficulty of the task increases (3, 11). Conversely, if the difficulty of the task can be sufficiently decreased, differences in anxiety level may result to the benefit of the high anxious *Ss* (5). Hence, these studies indicate that the difficulty existing either among several different tasks (5) or among the various components comprising a given task (3, 11) should be assessed, preferably on some basis independent of the performance of the high and low anxious groups which are being studied. Therefore, in order to determine the possibility that the five light button combinations in the present task may not have been equal with respect to the ease with which they could be learned, 20 *Ss* from among those who had participated in the previous experiment, and for whom anxiety scores were not available, were drawn at random and their performance on each of the five combinations was determined. The index of the difficulty of learning a given combination was the number of times, out of five, the first response to the light was the correct one, or more simply, the number of errorless trials.

Table 1 presents the results of this comparison. The combinations are numbered from I to V in order of increasing difficulty, i.e., in order of the decreasing number of errorless trials. For the present purposes it was decided to compare the performance of the high and low anxious *Ss* on the two easiest (I and II) and the two most difficult (IV and V) combinations.

TABLE 1

MEAN NUMBER OF ERRORLESS TRIALS MADE BY THE RANDOM SAMPLE OF 20 SUBJECTS ON THE FIVE SEPARATE LIGHT-BUTTON COMBINATIONS

	Combination Number				
	I	II	III	IV	V
M	3.40	3.05	2.45	2.40	2.00
SD	1.48	1.02	1.02	1.62	1.10

Table 2 presents the number of errorless trials for the high and low anxious groups for the easy and difficult combinations separately. It is apparent, on the basis of these data, that the high anxious children performed better, in comparison with the low anxious children, on the easy combinations, but more poorly on the difficult combinations. It can be noted that the performance of the high anxious children appeared to be more affected by the differences in the difficulty of the two sets of combinations than that of the low anxious children.

Table 3 presents a summary of an analysis of variance based on the data presented in Table 2. This indicates that the main effect of anxiety was not significant while the effects of task difficulty were significant at only the .10 level. Of greater interest, however, is the significant interaction between anxiety and task difficulty. This interaction may be interpreted to indicate that the effects of anxiety are dependent on the degree of difficulty involved in the task. This is in accord with the data presented in Table 2, showing that the position of superiority of the high anxious children on the easy combinations, in comparison with the low anxious children, is completely reversed on the more difficult combinations. Tests of the simple effects indicated that only the difference between the low and high anxious children on the difficult combinations was significant at beyond the .05 level ($F = 4.99$, $df = 1, 35$).

TABLE 2

MEAN NUMBER OF ERRORLESS TRIALS ON THE EASY AND DIFFICULT COMBINATIONS FOR THE HIGH AND LOW ANXIOUS GROUPS SEPARATELY

	Difficulty Level			
	Easy		Hard	
Group	*M*	*SD*	*M*	*SD*
High Anxious	5.00	2.41	3.33	1.29
Low Anxious	4.38	2.13	4.81	2.66

TABLE 3

SUMMARY OF ANALYSIS OF VARIANCE BASED ON NUMBER OF ERRORLESS TRIALS

Source	*df*	*MS*	*F*	*p*
Anxiety	1	3.31	....	
Error (b)	35	6.23		
Difficulty	1	10.59	2.99	$< .10$
Anxiety × Difficulty	1	20.10	5.68	$< .025$
Error (w)	35	3.54		

The present results are in general agreement with those found with the adult form of the anxiety scale in similar learning situations. In view of the fact that a difference in a scale score of only one was used as the basis for differentiating the low from the high anxious children in lieu of the more conventional procedure of selecting *Ss* from the extreme ends of the distribution, and that there was approximately a one-year interval between participation in the experiment and the time the anxiety scores were obtained, these results offer some encouragement to any future use of the scale with children.

Assuming that the index of the difficulty of the two sets of combinations reflected the presence of competing response tendencies of increasing strength, the present results indicated that the effects of anxiety varied as a function of this index. Consistent with the theoretical formulations outlined earlier, it could be assumed that on the easy combinations the correct response was stronger in relation to other competing responses which may have been aroused by the stimulus elements of these combinations. Under such conditions the effects of high anxiety should be expected to be beneficial to performance. In the case of the difficult combinations it could be assumed that other competing response tendencies were stronger in relation to the correct one; hence the effects of high anxiety, according to the theory, should be expected to be deleterious to performance.

In general these results suggest that the presence of anxiety in children can serve to determine performance in much the same way as with adults. Of more general importance, perhaps, the present results support the notion that the effects of anxiety can be more profitably studied if the characteristics of the task can be specified with regard to the number and relative strength of the competing response tendencies that may be aroused, as well as to whether or not the correct response is dominant. This appears to be in accord with clinical and casual observation that the consequences of a heightened level of anxiety may vary with the particular stimulating circumstances and the particular responses the individual has learned to make in such situations on the basis of previous experience.

Summary

The present study was concerned with the performance of fifth grade children in a complex learning task as a function of their scores on a scale of manifest anxiety adapted from Taylor's adult form for use with children and the relative difficulty of the various components comprising the task.

The high anxious group was composed of 21 children and the low anxious group of 16. The relative difficulty existing among the five components comprising the task was determined on the basis of performance of an independent sample of *Ss*. A statistically significant interaction was found between anxiety and task difficulty. This interaction was based on the tendency for the performance of the high anxious children to be inferior, in comparison with the low anxious children, on the difficult components of the task but with a tendency for their performance to be superior on the less difficult components.

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THE RELATIONSHIP OF ANXIETY IN CHILDREN TO PERFORMANCE IN A COMPLEX LEARNING TASK

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Using the Taylor scale of manifest anxiety (8) as a measure of motivation, a number of studies (4, 6, 7, 9) have attempted to relate the effects of different motivational levels to the performance of adult *Ss* in a variety of learning situations. The results of these experiments suggest that the performance of high anxious *Ss*, when compared with low anxious *Ss*, is superior in simple learning situations such as classical conditioning but inferior in more complex tasks such as trial-and-error learning.

In an attempt to broaden the use of the Taylor scale, Castaneda, McCandless, and Palermo (1) have recently revised the scale so that it is applicable to children in the fourth, fifth, and sixth grades. It was felt that problems similar in nature to those investigated with adults might be studied with children if such a scale were available.

According to the theory based on Hull (3) and extended by Spence (5), the effects of increases in motivational level on performance depend upon the relative strength of the correct and the incorrect or competing responses. If the correct response is dominant (strongest) over those incorrect responses competing with it or if it is the only response aroused in the situation, then an increase in motivation should facilitate performance. Thus, in the case of eyelid conditioning, if it is assumed that the correct response is dominant and there are few competing responses, it would be expected that an increase in motivation would lead to superior performance (7).

However, in more complex learning situations where one or more competing incorrect responses are dominant, the theory would predict an impairment in performance as a result of an increase in motivation. The

CHILD DEVELOPMENT, Vol. 27, No. 3 (September, 1956)

present investigation is concerned with attempting to determine the relationship of anxiety or motivation in children to performance in such a situation. *Ss* were required to learn to turn off different colored lights by the buttons which were connected to them. In this situation, if the correct response is not dominant, it would be expected that an increase in motivation should lead to poorer performance.

Method

Subjects

A total of 36 *Ss* from the standardization population of the children's form of the Taylor scale (8) were used as *Ss*. These *Ss* were selected from four fourth grade classes in three Iowa City public schools[1] on the basis of extreme scores on the scale. The anxious group consisted of 9 girls and 9 boys drawn at random from those *Ss* who participated in this study and whose scores fell approximately in the upper 20 per cent of the total standardization group, while the nonanxious group was composed of 9 girls and 9 boys drawn at random from those *Ss* who participated in this study and falling approximately in the lower 20 per cent. Anxiety scores for the nonanxious group ranged form 3 to 11 and from 23 to 33 for the anxious *Ss*.

Apparatus and Procedure

The apparatus consisted of a box 13 by 12½ by 5½ in. painted flat black. Projecting from its base was a sloping response panel approximately 7½ by 9½ by 13 in. Two push buttons were arranged on this panel on a horizontal plane spaced 6 in. apart and 2 in. from *S*'s edge of the panel and toward its center. On the panel between, but 2½ in. above, the two push buttons was a green jeweled reflector illuminated by a 6.3 volt pilot lamp. Centered 4 in. above the panel was a 1 in. diameter aperture of flashed opal glass. Housed behind the aperture were four colored lights: red, blue, amber, and white. The construction of the apparatus was such that by means of a rotary selector switch any single light could be activated and by means of a toggle switch either one of the two buttons could be set to turn it off. If the correct button was selected, the light went off and the green light on the response panel was activated. Incorrect responses affected neither the stimulus light nor the green light on the response panel.

All *Ss* were given 20 trials. All of the lights did not appear with equal frequency but the order was random except that no single light appeared twice in succession. Each light remained on until the correct response was made. Two of the lights were turned out by one button and two were turned out by the other button.

[1] The authors wish to express their appreciation to David K. Stewart, Elementary School Curriculum Coordinator in the Iowa City School System, and the principals and teachers involved for their cooperation and assistance.

The instructions were designed to indicate to *S* that he was to learn which button turned off each light and that if an error was made correction would be allowed.

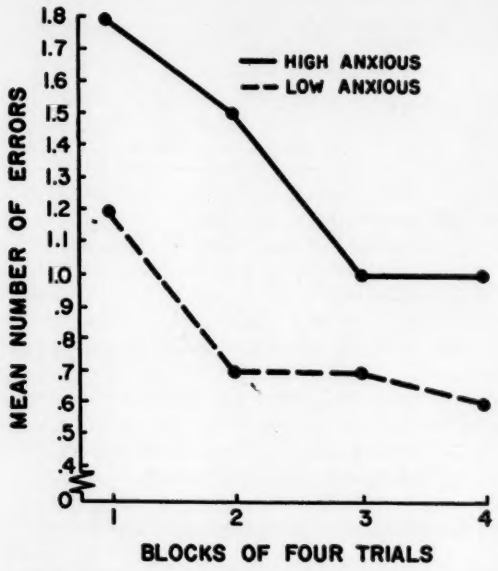

FIGURE 1—Error curves for the anxious and nonanxious *Ss* plotted in blocks of five trials.

RESULTS AND DISCUSSION

Figure 1 presents the learning curves of the anxious and the nonanxious *Ss* in terms of errors in blocks of five trials. It will be observed that with respect to each block of trials the nonanxious *Ss* were superior to the anxious *Ss*.

A summary of an analysis of variance based upon these data is presented in Table 1. As may be seen there is a significant decrease in errors over blocks of trials. More important, however, is the fact that the over-all differences between the errors made by the anxious and nonanxious groups is significant.

Previous experiments using the adult form of the Taylor scale have indicated that in complex learning situations where the dominant response

TABLE 1

SUMMARY OF ANALYSIS OF VARIANCE FOR ERRORS IN BLOCKS OF FIVE TRIALS

Source	*df*	*MS*	*F*	*p*
Anxiety	1	12.25	4.71	$< .05$
Error (b)	34	2.60		
Trials	3	3.13	5.49	$< .005$
Trials × Anxiety	3	.42	....	
Error (w)	102	.57		

is not correct, the anxious (high motivation) *S*s show inferior performance to that of the nonanxious (low motivation) *S*s. The present results are in line with previous work suggesting that the theory applied to adult *S*s is applicable in the present study with children and that the children's anxiety scale is a useful measure of motivational level.

As was stated previously, according to the theory the effects of increases in motivation on performance depend upon the relative strength of the correct and incorrect responses aroused by the experimental situation. The results of the present study and those of previous studies (2, 4, 6, 7, 9) suggest that specific attention should be given to the performance of anxious and nonanxious *S*s in situations where the strength of the correct and incorrect responses may be determined. For example, with problems such as the present one, it might be expected that the differences between the anxious and nonanxious *S*s would increase with increases in the number of light-button combinations since there would be a greater probability that more strong competing responses would be aroused. In discrimination learning problems it would be expected that difficult discriminations would be easier for the nonanxious than for the anxious. In the area of verbal learning it might be expected that a list of words of high association value and low intralist similarity would be easier for anxious *S*s than for nonanxious *S*s (4).

SUMMARY

The present experiment was concerned with the relation of motivational level to performance in a trial-and-error learning situation. The specific theoretical implication investigated was that the performance of anxious (high motivation) *S*s would be inferior to that of nonanxious (low motivation) *S*s in a learning situation which involved the presence of competing incorrect responses.

A group of 36 fourth grade *S*s were chosen on the basis of extreme scores made on a test of manifest anxiety, the 18 *S*s with high scores being

the anxious group and the 18 *Ss* with low scores being the nonanxious group. Both groups were run in a light-button motor task involving the presentation of 20 choices between two buttons.

The results were in agreement with similar studies using adult *Ss* and with the theoretical expectation that the anxious (high motivation) *Ss* would make significantly more errors in the learning task.

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VERBAL SOLUTIONS TO PARENT-CHILD PROBLEMS[1]

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Children frequently cross the adult-defined boundaries which separate desirable and undesirable behavior. When this occurs, adults, especially parents, often take action aimed at the reduction of these "boundary-crossings." Study of this action promises to yield valuable information concerning the parent's concept of the parental role, his basic attitudes toward the use of authority, the nature of the child, etc. The importance of this action from the standpoint of its effect upon children is obvious. It is hardly surprising then that some of the earliest studies in the area of child development concerned an analysis of parental control and of children's attitudes toward that control (12).

Despite the importance of the problem, empirical investigations of parental reaction to a child's misbehavior have been less than successful. The obvious difficulty which confronts the researcher is the unpremeditated or spontaneous character of these events. He just cannot be there when it happens. If he is fortunate enough to be present, his very presence represents a variable which may affect quite drastically the events he hopes to observe. As a substitute for this "on the spot" observing, researchers have most frequently used two approaches. They have turned either to reports of parents or children concerning past parental action (4, 9, 14) or to some assessment of parental attitudes toward children (2, 3, 6, 10, 11, 13). The techniques used to accumulate this information have ranged from survey questionnaires to clinical interviews. Conclusions based upon data provided

[1] This research is part of a study done at Teachers College, Columbia University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The writer wishes to acknowledge his deep indebtedness to Professors Millie Almy, Arthur I. Gates, Arthur T. Jersild, and Irving Lorge of that institution for their many valuable suggestions and criticisms.

by these approaches assume that some relationship exists between the parent's verbal report and his action in the home.

That the two approaches cited above have been fruitful is clear. That they are not without serious limitations should be equally clear. It is imperative then that alternative approaches be used to verify the conclusions culled from parental reports and attitude studies. One such alternative might be to present the parent with a hypothetical problem situation which he is asked to "solve." This little-used technique provided the body of data reported in this paper.

It is the purpose of this paper (*a*) to describe a system of coding by which the free responses of a group of adults to a series of hypothetical parent-child problems were classified, and (*b*) to report the substantive findings related to sex differences. Conclusions based upon these findings are compared with similar conclusions arrived at through different approaches.

Subjects and Procedures

The subjects used in this study were 105 parents of freshmen and sophomore college students. Forty-five fathers and 60 mothers participated in the study. The mean age of the fathers was 45.2; of the mothers, 43.1. Socioeconomically, the group was judged to consist largely of middle and lower class parents. This judgement was based on information concerning the occupations and education of the subjects.

A questionnaire-type instrument, designed by the writer, was used to obtain the data of this study. The instrument was sent to the parents by mail. An accompanying letter requested the subjects to omit any identifying information in their responses. Although the parents believed their responses to be anonymous, identifying marks hidden in the body of the instrument provided the researcher with the identity of the respondent. Briefly, the subjects were asked to write free responses to the following situations:

Situation 1: You are seated in your living room when your twelve-year-old son enters. As he takes off his jacket, a pack of cigarettes falls from his pocket.

Situation 2: You return from a shopping trip one afternoon, and discover that your six-year-old daughter has cut off her beautiful curls.

Situation 3: You ask your adolescent son what time he came home last night. He tells you midnight, but you had been downstairs until one o'clock in the morning, so you know this is not true.

Situation 4: Looking out of the window, you see your seven-year-old daughter with some other children tying a string of cans to a dog's tail.

Situation 5: While playing with his building set, your five-year-old son hits his thumb with a hammer and he begins cursing loudly with fairly vile language.

Situation 6: Glancing into your bedroom, you notice your twelve-year-old daughter taking money from your purse.

Situation 7: After a delicious dinner is placed before him, your six-year-old son says he is not hungry.

Situation 8: You tell your four-year-old that he cannot have any candy before supper. He says, "I want some," and begins to strike you with his fists.

Situation 9: After telling your ten-year-old son that he can't go swimming with the boys, you hear him mumble a nasty description about you.

Situation 10: When told that one of her teachers has been seriously injured in a car accident, your thirteen-year-old daughter remarks, "That's good. I didn't like her anyway."

Situation 11: You have asked your sixteen-year-old daughter not to associate with a certain boy in her class. She tells you she is going to spend the evening at a girl friend's house, but, while running an errand in town, you see her stepping into a car with that boy.

Although no attempt was made to determine the real-life frequency of the situations depicted, it was assumed that each situation would appear somewhat realistic to the subject. This assumption was confirmed by the many comments of the this-is-exactly-what-happened-to-me variety which a group of college students made during a trial run of the instrument.

Codification of the Responses[2]

Before the responses were examined, a trial set of categories was constructed. These categories resulted from an examination of the responses accumulated in the trial run mentioned above. The final categories were, with little change, those culled from the trial data.

An outline of the major categories used in the final classification appears below. For a more detailed listing of the categories the reader is referred to (7).

I. *Handling of Situation*

A. Acceptance
   1. Accept because nothing is wrong with behavior.
   2. Accept because a child did it.
   3. Accept because of infrequency.
   4. Accept under limited conditions.
   5. Accept to prevent deceit.

B. Explanation and/or Discussion
   1. Evaluate behavior and give reasons.
   2. Define conditions under which behavior might occur.
   3. Explain broad principles to child.
   4. Ask "loaded" question.

C. Natural Consequences
   1. Child will suffer enough from his own activities.

D. Information Giving
   1. Let child know that parent was aware of what was done.
   2. Evaluate behavior without explanation.

[2] The author is particularly indebted to Professor Irving Lorge for the many valuable suggestions which he offered at this stage of the study.

E. Bribery
   1. Promise reward for deterring.
   2. Call child's attention to a future pleasure.

F. Reprimand
   1. Scold, berate, argue.
   2. "Blow my top," "holler."

G. Assertion of Authority
   1. Urge the child "not to."
   2. Divert attention.
   3. Order, forbid, demand.
   4. Force to stop.
   5. Supervise child more closely.
   6. Alter situation so that it won't happen again.

H. Threat
   1. Of deprivation.
   2. Of natural consequences.
   3. Of physical punishment.
   4. Of loss of status, love.
   5. Of punishment (not elsewhere considered).

I. Compensation
   1. Have child do extra work.
   2. Have child pray for forgiveness.

J. Deprivation
   1. Remove privileges.
   2. Limit action, e.g., "Call indoors."
   3. Deprive child of social contact by ignoring.

K. Coercion to Repeat Behavior
   1. Noncorrection to get repeated natural consequences.
   2. Noncorrection to lead to guilt, shame.

L. Punishment (not otherwise specified)

M. Forced Admission of Error or Guilt
   1. Get word of honor.
   2. Get child to apologize.

N. Physical Punishment
   1. Spank, slap, whip, etc.
   2. Other, e.g. "Wash out mouth with soap."

O. Retribution
   1. Pay back in kind.

P. Creation of Shame
   1. Ridicule.
   2. Psychological pain, e.g. "Make child feel bad."

Q. Creation of Fear
   1. Create fear of natural consequences.
   2. Create fear of punishment.

II. *Elaboration of Situation*

X. Addition of Information
   1. Supplies facts (probable or definite).
   2. Supplies causes (probable or definite).
   3. Makes general statement, e.g. "All children do this."

Y. Search for Information
   1. Seeks facts.

2. Seeks causes.
3. Seeks general information, e.g. "I wonder if all children go through this state."

Z. Avoidance of Situation
1. Denies possibility of situation.
2. Expresses disapproval of behavior but does not act.
3. Places responsibility for action upon some other person.
4. Gives ambiguous reply, e.g. "So what?"

III. *Negation of Situation*

(In cases where the subject reported that he would *not* handle the situation in a given manner, the letter representing the method was placed in brackets with the following superscripts used to denote the reason for rejecting the method.)

( ) ^{0} No reason given.
( ) ^{1} Behavior not considered serious and/or frequent enough.
( ) ^{2} Method would be ineffective.
( ) ^{3} Method not appropriate to age of child.
( ) ^{4} Other.

Using the above categories it was possible to classify the major elements of extremely elaborate responses without wasting much of their richness. Due to space limitations, only two examples of this coding procedure will be given.

Response to situation 9: "First of all, this wouldn't happen to my son because I'd teach him to have a civil tongue. But if it did happen I would make him say the description out loud—he would feel pretty foolish. Then I would get the boy to come into the house and he would get the Ten Commandments read to him, especially 'Honor thy father and thy mother.'" Coded response: $Z_1K_2J_2B_3$.

Response to Situation 8: "I'd yell at him for hitting me but I probably wouldn't spank him since that might make matters worse. Then I'd explain to him that eating candy before dinner would spoil his appetite. I'd also promise him that he could have some candy after dinner if he stopped yelling." Coded response: $F_2(N_1)^2B_1E_2$.

In addition to the writer, an independent judge coded the responses of 20 subjects to the first four parent-child situations. The independent judge found 203 elements in these 80 responses as compared with 214 elements found by the writer. The two judgments were in perfect agreement on 181 or 84 per cent of the response elements.

Quantification of Coded Responses

As judged by five independent child psychologists, the methods of handling the situations are presented above in rank order: beginning with those which might place little pressure toward conformity upon the child and ending with those methods which might place great pressure toward

conformity upon the child. The five psychologists ranked the methods on the basis of the amount of pressure toward conformity which they abstractly associated with each method. The coefficient of concordance (8) among the five independent judgments was .93. Using this agreement as a rationale, the writer conceptualized a continuum of coercion upon which these methods were thought to be located. Thus, Bribery would be considered "intrinsically" more coercive than Information Giving; Reprimanding would be more coercive than Bribery, etc. Although it was impossible to locate logical steps on this continuum of coercion, once the continuum was defined some quantitative approximation of "degree" or "amount" seemed justified. Lacking the conditions which would make for a more sophisticated quantification, consecutive numbers were assigned to the ranked methods. Following this procedure Method A (Acceptance) was given the value of 1, Method B (Explanation) a value of 2, etc. These values were identical with the rank values given the methods by the group of psychologists.

Once the methods were assigned numerical values the possibility of comparing the "coerciveness" of two responses seemed apparent. This possibility was complicated, however, by the fact that most subjects suggested the use of more than one method of control in their response to a single situation. Thus, Subject X in response to Situation 1 might suggest Information Giving, Deprivation, and Threat. The problem then was to find some way of comparing X's response with that of Subject Y who in response to the same situation suggested the use of Physical Punishment and Explanation. As a solution the response of each subject was represented by two "scores." The numerical value of the *most* coercive method suggested in the response was called "high coercion score." The corresponding value of the *least* coercive method in the response was called "low coercion score." By comparing the high coercion score of two subjects it was possible to determine which of them suggested the most coercive method in response to a particular situation. A comparison of their low coercion scores indicated which of the two subjects suggested the milder method of control. By summing the high or low coercion scores of a number of subjects it was possible to compare groups in the same fashion as described above.

A third value, the difference between the high and low coercion scores of a subject, was given the term "coercion range." A subject who suggested both very severe and very mild methods obviously would have a larger coercion range than would a subject whose suggested methods clustered around the middle of the continuum of coercion.

Substantive Findings

The findings of this study which deal with differences between fathers and mothers are twofold.

TABLE 1

MEAN HIGH AND MEAN LOW COERCION SCORES OF FATHERS AND MOTHERS

Parent-Child Situation	*Mean High Score*		*Mean Low Score*	
	Fathers ($N=55$)	Mothers ($N=60$)	Fathers ($N=55$)	Mothers ($N=60$)
1	6.30	7.95	2.87	2.58
2	6.57	7.70	3.17	2.80
3	7.53	8.74	5.31	4.40
4	6.46	8.19	3.54	2.76
5	8.26	8.57	5.49	4.11
6	6.75	7.13	2.96	3.76
7	7.03	6.85	4.45	5.09
8	10.77	11.48	8.69	6.04
9	8.83	8.51	5.77	4.64
10	3.61	4.28	2.70	2.60
11	8.32	8.01	3.94	3.54

NOTE.—Considering all situations, the mean high coercion score of mothers was significantly greater than that of fathers ($p<.05$). Differences in mean low coercion scores were not statistically significant.

First, mothers suggested methods of control that were more coercive than were those suggested by fathers. Comparison of the high coercion scores of these two groups showed the mothers to be more coercive than were the fathers in response to eight of the eleven situations. These differences are observable in Table 1 by comparing parallel cells in the first two columns. Using an analysis of variance these differences yielded an F ratio of 6.41 ($F_{95} = 4.96$).

While there was a tendency for the low coercion scores of women to be lower than those for men, this difference was not statistically significant. The means of the low coercion scores for mothers and fathers are given in Table 1.

Secondly, in their responses to parent-child situations, mothers vacillated more between mild and severe methods than did fathers. A comparison of the coercion ranges of these two groups showed this value to be greater for mothers than for fathers in the responses to nine of the eleven situations. The size and direction of these differences are observable in Table 2. Using an analysis of variance these differences yielded an F ratio of 10.17 ($F_{99} = 10.04$).

In sum, the above findings suggest that mothers subscribe to the use of methods of control which are more coercive than those suggested by fathers. However, mothers are also more likely than are fathers to couple these highly coercive methods with some of the milder methods of control.

TABLE 2

COERCION RANGES OF FATHERS AND MOTHERS

Parent-Child Situation	*Coercion Range of* Fathers ($N=55$)	Mothers ($N=60$)
1	3.43	5.37
2	3.40	4.90
3	2.22	4.34
4	2.92	5.43
5	2.77	4.46
6	3.79	3.37
7	2.58	1.76
8	2.08	5.44
9	3.06	3.87
10	.91	1.68
11	4.38	4.47

NOTE.—Considering all situations, the coercion range was larger for mothers than for fathers ($p<.01$).

DISCUSSION

Few studies which concern parental action or parental attitudes fail to mention differences between the sexes. In general, the findings portray fathers as being more punitive, restrictive or authoritarian than are mothers, who tend toward the "warm," "permissive" end of the continuum. Although recent studies suggest that the fathers of today are less punitive than were their prototypes of a generation ago, they also suggest that both parents are moving toward the permissive end of the continuum without drastically changing their positions relative to each other (9). These findings agree in substance with the widely-held cultural standards of femininity and masculinity. Thus, the notion of a punitive, aggressive male and a loving, passive female are at least not contradicted by research findings. The results of this study, however, raise some questions concerning these traditional sex differences. Obviously, the findings reported above cannot be directly compared with the results of previous studies due to differences in the nature of the data. The conclusions, however, which seem to follow from these data are at variance with conclusions which were derived from other studies dealing with the general problem of parental behavior.

Although it would be interesting to speculate on why females are seen as being less punitive than are males when the measuring instrument is some type of an attitude questionnaire, no attempt will be made to do so here. An attempt will be made, however, to explain why this difference seems to reverse itself when the object of investigation is the written response of a parent to a hypothetical parent-child situation.

To offer an *a posteriori* explanation for the reported sex differences, it is necessary to consider the expectations which our society places upon the behavior of each sex in general as well as the differential role in child training which is expected of men and women. Considering the latter expectation first, it would seem that the mother is held more responsible for the child's behavior than is the father. This expectation results, in part, from the father's prolonged absence from the home as well as from his involvement in the more general task of "caring for" the family. Because of their reflection on her performance as a mother, acts of misbehavior would be more important to her than they would be to the father. The mother then would be more apt to use methods of control which would ensure the disappearance of the undesired behavior. Hence, we find in her solutions to hypothetical parent-child problems the suggested use of methods of control which are more coercive than those suggested by males.

However, in our society punitive or aggressive behavior is tolerated more in men than in women. The cultural concept of a punitive father and a warm, loving mother is one that tends to persist. Therefore, a woman is violating the societal concept of femininity to the degree that she behaves in an aggressive or punitive manner. Within the context of the parent-child relationship the pressing demands of being a "good mother" frequently may necessitate the use of methods which are decidedly aggressive. The mother may dilute these unfeminine actions, however, by coupling them with milder, more feminine methods. Thus it was found that in their solutions to parent-child problems women coupled severe methods with mild methods more so than did men.

The above explanation is in accord with recent formulations in role conflict theory. A concise statement of this theory follows:

> In certain situations *role conflicts* occur. That is, the situations are so ordered that an actor is required to fill simultaneously two or more roles that present inconsistent, contradictory, or even mutually exclusive expectations. The actor cannot realistically conform to these expectations. He is then forced to choose one of several alternatives: he may abandon one role and cling to the other, he may attempt some compromise between the roles, or he may withdraw either physically or psychologically from the roles altogether (5, p. 165).

Stated in terms of this study, the female respondents found it difficult to fill the roles of "mother" and "woman" simultaneously. Of the alternatives suggested in the above quotation, they predominately chose the second. Their attempt at a compromise between the demands of femininity and the demands of motherhood resulted in the patterning of responses described previously.

A final word should be said about the multiplicity of methods suggested in response to single situations. If these responses are at all related to the real life action of parents, this finding is important. It suggests that a one-

to-one relationship between a problem situation and a method of control rarely exists. Parents are quite versatile. They do not threaten *or* scold *or* spank; rather, they are more likely to threaten *and* scold *and* spank. One possible reason for this multiplicity of action was discussed above. If it occurs in real life situations, the effect upon the child of this buck-shot approach remains a question worthy of further research.

Summary

A content analysis technique was used to classify the written responses of 167 college students and 105 parents of these students to 11 hypothetical parent-child situations. A procedure for quantifying the classified responses was described.

Differences in the responses of fathers and mothers were found to be at variance with the popular stereotypes of a punitive male and a permissive female. Tentative explanations of these differences were offered within the framework of role conflict theory.

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REFERENCE GROUPS OF RURAL HIGH SCHOOL YOUTH [1]

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The hypotheses of this paper are the ones long held in sociology that, in a pluralistic society such as our own, an individual is moved to rank the groups to which he belongs or which he otherwise knows about and that his attitudes and behavior reflect the dominant values of the top groups in this hierarchy more than those of the lower groups. Recently this concept of the highly-valued groups has been given the label "reference groups," a term apparently used first by Herbert Hyman (1). This paper considers only those reference groups which are also membership groups (that is, groups to which the individuals studied themselves belong).

The data consists of answers to questionnaires filled out by all students (except for those absent on the typical school day when the survey was taken) in four rural high schools, representing widely different areas in Minnesota. The questionnaires were administered in classrooms by an advanced graduate student at the University of Minnesota, who assured the subjects of anonymity and of the legitimate purposes of the study.

The main question used to ascertain reference groups was "In your life which is most important?" and permitted checking of the following: (*a*) school chums; (*b*) relatives (uncles, aunts and cousins); (*c*) social clubs; (*d*) work groups; (*e*) church groups; (*f*) immediate family (father, mother, brothers, sisters). Of the 582 students filling out the questionnaire, 18 provided no answer to this question and 54 gave more than one answer; both of these categories of individuals were excluded from the analysis. Only four students gave "relatives" as their reference group; the small

[1] Design and analysis of this study were carried on under a grant from the Rockefeller Foundation, and the field work was financed by the Minnesota Agricultural Experiment Station and the Graduate School of the University of Minnesota. Field work was done by Edward Hassinger and William Cofell as part of a larger study under the direction of Douglas G. Marshall and Lowry Nelson. The author expresses his appreciation to all the above as well as to Marvin J. Taves and Caroline B. Rose for a critical reading of this paper.

TABLE 1

BACKGROUND OF CHOICE OF REFERENCE GROUPS

	PERCENTAGE GIVING INDICATED ANSWER AMONG:					
	Boys for whom following groups are most important			Girls for whom following groups are most important		
	School Chums	*Immediate Family*	*Organized Groups*	*School Chums*	*Immediate Family*	*Organized Groups*
Reported life satisfaction of father						
Very satisfied	29.4	41.0	39.6	46.7	42.6	31.6
Satisfied	53.0	38.5	43.7	30.0	30.2	47.3
Average	17.6	13.9	12.5	13.3	12.9	15.8
Dissatisfied	0.0	0.6	0.0	0.0	2.7	0.0
Very dissatisfied ..	0.0	0.0	2.1	3.3	0.0	0.0
No answer	0.0	6.0	2.1	6.7	11.6	5.3
Reported happiness of mother						
Very happy	41.2	34.9	33.3	35.7	33.8	36.8
Happy	29.4	49.5	41.7	44.3	46.2	42.1
Average	29.4	10.2	14.6	13.3	16.0	10.5
Unhappy	0.0	3.0	2.1	6.7	1.3	5.3
Very unhappy	0.0	0.6	0.0	0.0	0.0	0.0
No answer	0.0	1.8	8.3	0.0	2.7	5.3
Father's participation in voluntary associations						
Yes	58.8	48.2	37.5	30.0	43.1	42.1
No	41.2	45.8	58.3	63.3	49.3	52.5
No answer	0.0	6.0	4.2	6.7	7.6	5.4
Mother's participation in voluntary associations						
Yes	58.8	62.0	47.9	43.3	40.9	47.4
No	41.2	35.5	47.9	56.7	57.3	47.4
No answer	0.0	2.5	4.2	0.0	1.8	5.2
Number of siblings						
None or one	17.6	10.3	10.4	20.6	12.5	16.0
Two or three	17.6	37.9	31.3	41.0	29.5	5.3
Four to seven	53.0	37.9	35.4	31.6	42.6	57.4
Eight or more	11.8	13.9	22.9	6.8	15.4	21.3
Estimation of popularity with other students						
Very popular or popular	29.4	18.7	14.6	26.7	16.9	10.6
Average	65.6	76.5	79.1	56.6	76.9	73.6
Unpopular or very unpopular	0.0	2.4	4.2	0.0	3.1	15.8
No answer	5.0	2.4	2.1	16.7	3.1	0.0
N	17	166	48	30	225	19

number precluded any analysis of this category. Those indicating church groups (42 cases), work groups (16 cases), and social clubs (4 cases) were combined into a single category hereafter labelled "organized groups."

Factors Associated with Choice of Reference Group

Table 1 indicates some background characteristics of the boys and girls, as they report them themselves, which might be thought to direct the selection of the different reference groups. These background traits probably existed before the reference group was chosen and hence could have influenced the choice. There is no consistent association of the degree of life satisfaction or happiness of the parents and the tendency to choose the immediate family as the reference group. Only a slightly larger percentage of boys who indicated "immediate family" as their reference group said their fathers were very happy, as compared to those who chose other reference groups, but these same boys reported their mothers to be slightly less happy, on the average. Among the girls, even these differences did not appear. If happiness of parents does not help to direct the choice of reference group, it might be thought that this important background variable is blunted in its influence on children possibly because it stems from, and reflects itself in, activities of the parents outside the home rather than within it. But data on the parents' participation in voluntary associations also show no consistent relationship to the children's choice of reference group.

The number of siblings, however, does show a relationship to the choice of reference group: In families where there are few or no siblings, children are more likely to choose school chums as their reference groups, whereas in large families, children are more likely to choose organized groups as their reference groups.

Concerning the child's estimation of his popularity with his schoolmates, it is difficult to say whether this is possible cause or possible effect of his choice of reference group.. There is a significant association between these two, however: Children who choose school chums as a reference group are more likely than other children to consider themselves popular. On the other hand, children who choose organized groups as their reference groups are least likely to think of themselves as popular with their schoolmates. These relationships are found among both boys and girls and are statistically significant at the 90 per cent level of confidence, which criterion of significance is used throughout this paper.

The Influence of the Reference Group on Social Participation and Career Plans

We turn now to some of the expected *consequences,* in behavior and attitude, of choice of certain reference groups by our rural high school

TABLE 2

ATTITUDES AND BEHAVIOR ASSOCIATED WITH REFERENCE GROUPS

	PERCENTAGE GIVING INDICATED ANSWER AMONG:					
	Boys for whom following groups are most important			Girls for whom following groups are most important		
	School Chums	*Immediate Family*	*Organized Groups*	*School Chums*	*Immediate Family*	*Organized Groups*
Number of organized activities youth participating in*						
None	11.8	4.2	6.2	3.3	12.0	0.0
One	0.0	8.4	18.7	13.3	8.4	15.8
Two	29.4	13.3	14.6	6.7	10.2	10.5
Three or four	17.6	23.5	29.3	26.7	29.9	36.8
Five or six	23.5	29.0	14.6	30.0	21.3	26.3
Seven or eight	11.8	10.2	10.4	6.7	9.3	5.3
Nine or more	5.9	11.4	6.2	13.3	8.9	5.3
Desire to quit school now						
Yes	11.8	6.6	6.2	3.3	4.0	5.3
No	88.2	82.6	87.6	93.4	88.9	84.2
Undecided	0.0	10.8	6.2	3.3	7.1	10.5
Expect to do when finish high school†						
Go farming	35.3	24.7	27.1	3.3	1.8	0.0
Get full-time job	29.4	33.1	25.0	30.0	39.6	47.4
Vacation 3-4 mos. & then get full-time job	11.8	8.4	6.2	0.0	4.0	5.3
Get part-time paid job	17.6	10.2	8.3	23.3	14.7	15.8
Vacation 3-4 mos. & then get part-time job	0.6	1.2	2.1	0.0	2.7	0.0
Go to college or vocational school	17.6	25.3	25.0	36.7	35.6	26.3
Misc: Housework, loaf, armed serv.	0.0	12.7	14.6	6.7	12.4	5.3
Don't know	0.0	0.6	2.1	3.3	0.0	0.0
N	17	166	48	30	225	19

* The list does not include church affiliation, which explains why a few of the boys could indicate that they participated in no organized activities and yet say that their reference group was an organized group: these boys indicated more specifically that their reference group was the church.

† Percentages add up to more than 100 as some respondents gave more than one answer.

youth. There seems to be no reliable and consistent pattern of differences among the youth who have chosen the three different kinds of reference group in regard to two important matters raised in our survey (Table 2): (1) the number of organized activities the youth participates in, both in and out of school, and (2) the desire to quit school (at the time of the survey).

There is some difference, however, in regard to plans for after high school graduation. Among the boys, a slightly larger proportion expected to go into farming, or get a part-time job, or vacation for several months and then get a full-time job, if their reference group was "school chums." If their reference group was their immediate family, however, they were more likely to be planning to get a full-time paying job immediately or to go to college. If their reference group was an organized group, they were also more likely to be planning to go to college or into the armed services or to loaf.

Among the girls whose reference group was their school friends, a disproportionately large number expected to get a part-time job or go to college. Girls whose reference group was some organized group were distinctive in their tendency to expect to get a full-time paying job and not go to college.

Factors Associated with Intimacy of Family Life

By far the most frequently mentioned reference group is the immediate family, and because the degree of intimacy with the immediate family seems so important, it is analyzed further. Tables 3 and 4 present cross-tabulations with answers to the question "How close (intimate) a family life do you have with your parents and brothers and sisters?" There is a very high correlation, as might be expected, between intimacy of family life and fondness for the parents, although the correlation is not quite as high as was found to prevail among a sample of University of Minnesota students (3). The correlation is higher among boys than among girls, especially in regard to fondness for father, in spite of the fact that more girls than boys claim to be very fond of their parents.

Both a very large number and a very small number of siblings seem to be associated with intimacy of family life: The boys who have between three and seven siblings, and the girls who have between two and five siblings, report having the least intimate family life. While few students consider themselves unpopular with their schoolmates, the lowest relative popularity was found among those who have the least intimate family life. We have already seen that these are the youth whose reference group tends to be an organized group, especially a church group.

Intimacy of family life is also negatively correlated with definiteness of selection of a future occupation: Especially among the boys with the

TABLE 3

CONDITIONS ASSOCIATED WITH INTIMACY OF FAMILY LIFE

	PERCENTAGE GIVING INDICATED ANSWER AMONG:					
	Boys who say their family life is			Girls who say their family life is		
	Very Close	*Close*	*Not Very Close or Not Close at All*	*Very Close*	*Close*	*Not Very Close or Not Close at All*
Indicated fondness for father						
Very fond	87.4	54.5	22.2	82.1	56.7	44.4
Moderately fond	9.9	32.2	38.9	9.7	36.9	55.6
No particular feeling either way	0.9	7.0	27.8	0.7	2.8	0.0
Rather dislike him	0.9	0.0	5.6	0.0	0.0	0.0
No answer	0.9	6.3	5.5	7.5	3.6	0.0
Indicated fondness for mother						
Very fond	91.9	69.2	38.9	94.5	73.8	50.0
Moderately fond	7.2	24.5	38.9	2.8	22.7	44.4
No particular feeling either way	0.9	3.5	16.7	0.7	2.1	5.6
Rather dislike her	0.0	0.0	0.0	0.7	0.0	0.0
No answer	0.0	2.8	5.5	1.3	1.4	0.0
Number of siblings						
None or one	12.6	11.2	11.1	18.6	12.7	11.1
Two	20.7	11.9	11.1	10.3	12.1	16.7
Three to five	34.2	44.1	44.4	38.7	44.8	44.4
Six or seven	15.3	14.7	16.7	18.0	16.3	0.0
Eight or more	17.2	17.5	16.7	13.7	14.1	27.8
No answer	0.0	0.6	0.0	0.7	0.0	0.0
Indicated popularity with classmates						
Very popular	3.6	0.7	0.0	5.5	4.3	0.0
Popular	24.3	14.7	5.6	16.6	11.3	5.6
Average	64.9	81.8	83.3	71.0	77.4	94.4
Unpopular or very unpopular	1.8	2.1	11.1	4.9	3.5	0.0
No answer	5.4	0.7	0.0	2.0	3.5	0.0
Training for certain (specified) occupation						
Yes	50.5	55.2	72.2	57.9	62.4	66.6
No	26.1	23.1	0.0	19.3	14.2	5.6
Not training for occupation	20.7	19.6	11.1	20.7	21.3	22.2
No answer	2.7	2.1	16.7	2.1	2.1	5.6
N	111	143	18	145	141	18

TABLE 4

EXPECTATIONS FOR FUTURE ASSOCIATED WITH INTIMACY OF FAMILY LIFE

	PERCENTAGE GIVING INDICATED ANSWER AMONG:					
	Boys who say their family life is			Girls who say their family life is		
Expectations	*Very Close*	*Close*	*Not Very Close or Not Close at All*	*Very Close*	*Close*	*Not Very Close or Not Close at All*
For activity after high school graduation						
Farming	23.4	28.0	33.3	2.1	2.8	5.6
Full-time paid job	32.4	30.1	33.3	40.0	42.6	27.8
Vacation then full-time job	7.2	9.8	5.6	4.8	4.3	11.1
Part-time paid job	9.9	8.4	11.1	16.6	11.3	16.7
Vacation then part-time paid job	0.9	2.1	0.0	2.1	3.5	0.0
College	34.2	16.1	16.7	29.0	35.0	38.9
Misc: Housework, loaf, armed serv.	12.6	14.7	27.8	11.7	12.8	16.7
Don't know	0.9	0.7	0.0	0.7	0.0	0.0
For staying or leaving community						
Stay	42.3	39.9	33.3	31.7	31.9	22.2
Leave	46.9	46.8	61.1	62.1	61.0	72.2
Don't know	8.1	12.6	5.6	5.5	5.0	5.6
No answer	2.7	0.7	0.0	0.7	2.1	0.0
For age of marriage (in years)						
Under 20	0.0	1.4	0.0	7.6	7.8	11.2
20–21.9	13.5	9.8	33.3	37.2	40.4	27.8
22–24.9	37.9	29.3	33.3	32.4	35.5	27.8
25–27.9	23.4	25.9	16.7	6.9	5.7	11.1
28 or over	3.6	8.4	5.6	4.2	2.1	11.1
Don't want to marry	4.5	5.6	11.1	2.1	2.1	5.5
Don't know or no answer	17.1	19.6	0.0	9.6	6.4	5.5
For future number of children (wanted)						
None	4.5	9.1	22.2	4.1	6.4	5.6
One or two	17.1	24.5	33.3	22.1	20.6	16.7
Three to five	44.2	40.6	22.3	51.7	53.2	55.6
Six to eight	8.1	4.2	0.0	9.0	9.2	16.7
Nine or more	9.9	4.2	16.7	6.2	2.1	0.0
Don't know or no answer	16.2	17.4	5.5	6.9	8.5	5.4
N	111	143	18	145	141	18

most intimate family life there are the largest proportion who are not training for any definite occupation. (There is no status differential in the occupations toward which the youth in the three categories of family intimacy are aiming, except that a larger proportion of boys with the least intimate family life are training to be farmers.)

This greater definiteness of choice of occupation among those with the loosest family ties reflects itself in the youngsters' plans for the period immediately following graduation: Those boys most intimate with their families have a greater expectation of going on to college, while those least intimate with their families are more likely than the others to expect that they will go into farming or do some unusual thing. While more boys are planning to leave the community than to stay, a larger proportion of those least intimate with their families are planning to leave and this probably has something to do with their choice of miscellaneous plans for the period following graduation.

The pattern among girls is somewhat different: While the girls with least intimate family ties also are most likely to indicate that they have miscellaneous unusual plans for the post-graduation period, they differ from the boys in this category by including the largest proportion who are planning to go on to college. A greater majority of the girls than of the boys, and again the proportion is greatest among those with least intimate family ties, are definitely planning to leave the community when they become adults.

Plans for their private life are also most unusual for those with the least intimate family life. A larger proportion of them are planning to get married either at a very young age, at a relatively advanced age, or not at all. A larger proportion of the boys among them want either no children or a very large number of children (the girls do not vary in this respect with the degree of intimacy of family life). The same tendency, to expect or plan on a relatively unusual adult life, was also found among those with least intimate family ties in the earlier study of University of Minnesota students. The evidence of the earlier study was that "responsible" behavior and "responsible" planning for adult life was most likely to be found among those with the most intimate family life, and the evidence from the present study—while not as definitive as the earlier one—suggests that this is also true among rural high school youth.

Factors Associated with Peer Group Popularity

We turn now to a closer analysis of another aspect of reference group behavior—popularity with schoolmates. We have already seen that popularity is somewhat associated with choosing school chums as the chief reference group. A much stronger correlation is noted in Table 5 between popularity and optimism regarding future life chances. Whether the estima-

TABLE 5

EXPECTATIONS FOR FUTURE ASSOCIATED WITH POPULARITY IN SCHOOL

Expectations	PERCENTAGE GIVING INDICATED ANSWER AMONG: Very Popular Boys and Girls	Popular Boys	Average Boys	Popular Girls	Average Girls	Unpopular Boys and Girls
For future chances in life						
Very good chance	50.0	22.4	15.4	36.6	17.5	15.0
Good chance	22.2	57.2	49.6	43.9	41.0	25.0
Average	16.7	14.3	32.2	17.1	36.7	50.0
Poor chance	0.0	2.0	1.4	2.4	3.5	10.0
Very poor chance	11.1	0.0	0.0	0.0	0.4	0.0
Don't know or no answer	0.0	4.1	1.4	0.0	0.9	0.0
For age of marriage (in years)						
Under 20	16.7	0.0	1.0	5.8	6.9	5.0
20–21.9	50.0	16.3	11.5	37.0	37.1	20.0
22–24.9	0.0	46.9	31.2	38.1	37.1	25.0
25–27.9	5.6	20.4	26.0	8.0	7.9	10.0
28 and over	11.1	2.0	6.2	2.9	3.1	10.0
Don't want to marry	0.0	4.1	6.7	1.6	1.7	15.0
Don't know or no answer	16.6	10.3	17.4	6.6	6.2	15.0
For number of children (wanted)						
None	0.0	6.1	8.2	4.9	4.8	25.0
One or two	27.8	20.4	22.5	17.0	21.8	10.0
Three to five	33.3	51.0	39.9	63.5	53.4	30.0
Six to eight	5.6	6.1	5.8	4.8	10.9	5.0
Nine or more	22.2	2.0	7.7	2.4	2.6	15.0
Don't know or no answer	11.1	14.4	15.9	7.4	6.5	15.0
For staying in or leaving community						
Stay	27.8	32.7	41.8	26.8	31.4	45.0
Leave	38.9	57.1	46.1	68.3	62.4	55.0
Don't know	33.3	8.2	10.6	4.9	4.4	0.0
No answer	0.0	2.0	1.5	0.0	1.8	0.0
N	18	49	208	41	229	20

tion of personal popularity is based on the realities of the situation or not, apparently it and optimism reflect an important aspect of the youth's outlook on life. A curious finding here is that the proportion planning to stay in the community increases with progressively *lower* popularity. While this is partly a function of the concentration in the very popular group of those who say they do not know their future plans concerning staying in the community, it also seems to reflect important differences in general outlook on life.

Expectations for getting married at either a very young or a very late age do not seem to be correlated with estimation of popularity. But there is a significant minority among the unpopular who say they do not want to get married at all, which is not found among the other groups of youngsters. A similar pattern is revealed in response to the question concerning the number of children wanted. A fourth of the unpopular group do not want any children at all, which is a much higher percentage than that found in any other popularity group. Those wanting a very large number of children are concentrated in the two extreme groups in terms of popularity.

Reference Group Values and Expectations for the Future

Expectations for future adult life are linked to reference groups at least partly through the values which these reference groups hold. We sought to get at the relevant values of two major reference groups—parents and school chums—as well as personal aspirations for the future, by means of three projective-type questions:

1. Name three qualities or achievements you might have when you become an adult for which you think your parents would praise you.
2. Name three qualities or achievements you might have when you become an adult for which you think your school friends would praise you.
3. Name three qualities or achievements that you yourself would like to have as an adult.

Answers evoked by these directions are presented in Table 6, cross-tabulated by the reference groups of the boys and girls. The most general finding, which is supported by the percentages at several points in the table, is that where there is a discrepancy between what the parents and school friends would praise the subject for, those subjects whose reference group is their family tend to have personal aspirations reflecting the parents' values, while those whose reference group is their "school chums" tend to have personal aspirations reflecting the school friends' values. Other noteworthy conclusions that can be drawn from the table are:

1. The most frequently mentioned aspiration is an occupation. It is significantly more frequently mentioned by those whose reference group is "school chums" than by those whose reference group is "immediate family" or "organized groups." This differential is maintained when the occupation is farming. This orientation toward occupation on the part of those whose reference group is school chums—which seems to be encouraged both by their parents and by their school chums—helps to explain the previously mentioned finding that individuals in this category are the ones most likely to be planning to go to work when they graduate from high school.

2. Material success is also very frequently mentioned as an aspiration. In most cases when success is the aim, occupation is specified. Boys are more likely than girls to mention occupational success as an aspiration for

TABLE 6

REFERENCE GROUPS AND VALUED QUALITIES OR ACHIEVEMENTS

(percentages naming indicated qualities or achievements)*

	Qualities or achievements praised BY PARENTS						Qualities or achievements praised BY SCHOOL FRIENDS						Qualities or achievements desired BY SELF					
	Among *boys* whose reference group is:			Among *girls* whose reference group is:			Among *boys* whose reference group is:			Among *girls* whose reference group is:			Among *boys* whose reference group is:			Among *girls* whose reference group is:		
	School Chums	*Family*	*Organized Groups*	*School Chums*	*Family*	*Organized Groups*	*School Chums*	*Family*	*Organized Groups*	*School Chums*	*Family*	*Organized Groups*	*School Chums*	*Family*	*Organized Groups*	*School Chums*	*Family*	*Organized Groups*
1. Get a job or specific occupation (excluding farming)	68	28	45	100	57	69	73	21	25	85	48	49	97	20	38	84	45	42
2. Be a farmer	39	17	18	5	0	0	36	13	16	0	1	0	35	16	19	0	0	0
3. Be successful: Generally	39	29	27	10	20	17	9	26	13	20	19	35	0	25	25	20	18	12
In occupation	48	50	33	19	38	23	55	43	32	15	29	28	62	57	44	15	31	42
In style of life	10	15	3	5	5	6	9	17	10	10	4	0	9	24	6	10	9	12
4. Be a good family member	0	7	3	38	17	6	0	0	3	20	9	21	0	2	0	20	12	30
5. Have a good family and home life	19	21	18	5	19	29	18	15	16	25	19	21	9	35	28	25	33	60
6. Be socially adjusted and popular	0	12	12	29	23	23	0	46	28	35	43	21	9	18	19	34	39	30
7. Have a nice appearance	0	4	0	0	1	0	0	2	0	5	4	7	0	2	9	5	3	0
8. Have good character traits	10	43	21	33	37	23	18	38	38	35	40	21	27	27	9	34	32	12
9. Be religious	0	13	15	19	13	0	0	5	10	10	7	7	0	4	9	10	10	6
10. Be a good citizen and help others	0	6	9	5	9	0	0	10	13	0	11	0	0	7	13	0	11	0
11. Have talent: Mental	19	20	27	19	26	17	0	11	19	10	18	28	0	14	9	10	16	6
Physical	10	9	15	10	11	6	9	15	16	10	13	7	18	11	13	10	9	0
12. Be happy and do what I like	10	5	9	0	10	23	36	12	16	15	4	21	27	21	22	15	19	24
13. Miscellaneous and trivial	10	1	0	0	0	0	0	1	0	0	2	0	0	1	0	0	1	0
14. Don't know	18	20	45	3	14	58	37	25	45	5	29	34	7	16	37	8	12	24
Total	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
N	17	166	48	30	225	19	17	166	48	30	225	19	17	166	48	30	225	19

* Percentages add to 300 per cent as each subject was asked to give three responses to each question. Cases of "no answer" were excluded from the calculations.

themselves and as a future achievement for which their parents and school friends would praise them.

3. Social adjustment and popularity are more frequently mentioned as personal aspirations and as achievements which school friends would praise than as achievements which parents would praise. In general girls think more of these traits than do boys.

4. Girls are also more likely than boys to think of being a good family member. They are especially likely to consider this a goal for themselves if their reference group is an organized group rather than their family or school chums. But when guessing what their parents would praise them for, girls are more likely to mention being a good family member when their reference group is their school chums.

5. Character traits and talents which are the goals of the ideal typical "inner-directed" personality are less frequently mentioned as aspirations and praised goals than are material success and occupations that we have already considered. This fact supports Riesman's hypothesis that other-directed characteristics are more highly valued than inner-directed ones (2). Notably, being religious and being a good citizen are infrequently mentioned. Among boys, those whose reference groups are organized groups are more likely to mention these latter goals than those whose reference groups are family or school chums.

6. Good character traits are generally as likely to be mentioned as personal aspirations as they are to be considered as something which parents and school friends would praise. This fact contradict's Riesman's hypothesis that the *trend* is away from evaluating good character highly, at least as perceived by the youngsters in our study.

7. Those whose reference groups are organized groups are consistently most likely to say they "don't know" what their personal aspirations are and what their parents and school friends would praise them for. It is this category of our sample which is thus least oriented toward their future as adults.

8. In addition to Riesman's categories of "inner-directed" and "other-directed," [2] one might distinguish another broad set of life-goals which is represented by our category 12, "Be happy and do what I like." We might label this the "gratification-directed" or hedonic personality. It approximates the ideal formulated by psychoanalytic theory. That it may be an increasingly frequent type of personality is suggested by the fact that it is mentioned more frequently as a personal aspiration and as a trait which school friends would praise than one which parents would praise. Further, those whose reference group is the immediate family (that is, those particularly oriented toward their parents) are less likely to refer to this trait than are those

[2] Riesman has a third category of "tradition-directed" which we have not been able operationally to distinguish from "inner-directed" in this study.

whose reference groups are school chums (for the boys) or organized groups (for the girls).

Summary

This study has examined just a few of the background characteristics, behaviors, and attitudes that might be hypothesized to be associated with the different membership reference groups held among rural high school youth. The statistically significant differences among youth with different reference groups were in regard to number of siblings, estimation of popularity among schoolmates, and plans for the period after graduation.

The most frequently mentioned reference group was the immediate family, and analysis was made of various characteristics associated with different degrees of reported intimacy of family life. Intimacy of family life was very highly correlated with fondness for father and mother, and was more characteristic of children who had either very few or very many siblings. Those very close to their families were also more likely than others to be popular with their schoolmates, uncertain about their future vocation, planning to leave the community when adult, get married at an average age and have a moderate number of children. Planning to go to college showed different relationships by sex: Among boys, it was those who are closest to their families who are planning for college, while among girls the opposite was true.

Popularity was associated with the desire to leave the community when adult and with optimism regarding future life chances. Those who did not want to get married or have children were concentrated among the unpopular.

Aspirations regarding personal qualities or achievements were found to be related to what were perceived to be the values of one's reference groups. Evidence was found supporting Riesman's hypothesis that qualities of the "other-directed personality" are more highly valued than are qualities of the "inner-directed personality." But there was no discrepancy in this regard between the youths' own values and what they perceived their parents' values to be. There was a tendency, however, for the youth to aspire to qualities of what might be called the "gratification-directed" or "hedonic" personality more than their parents were perceived to do so.

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FILM-MEDIATED FANTASY AGGRESSION AND STRENGTH OF AGGRESSIVE DRIVE [1]

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Those concerned with healthy personality development have shown considerable interest in the effects which the mass media may have upon children. Much of this interest has centered on the possible harmful effects of the aggressive and hostile themes which predominate in many entertainment films, commercial television programs, and comic books.

However, one frequently encounters the reassuring assertion that children's involvement in such themes may provide a useful "outlet" for their aggressive impulses. This "release" notion is expressed in psychoanalytic theory in the concept of catharsis, has been codified in behavior theory, and is an accepted and intrinsic part of many theories of psychotherapy. Its usefulness in an evaluation of the effects of violence in the mass media has been widely accepted, but we lack experimental evidence which either affirms or infirms its worth. The present study is one attempt to subject to experimental test the "release" theory as it applies to the effects of violence in the mass media.

THE HYPOTHESIS OF EQUIVALENCE OF FORMS

Behavior theorists have given considerable attention to the dynamics of aggressive motivation. They have reasoned that aggression develops as a secondary drive early in the socialization process (21, 22), and that in

[1] Professors Lois Meek Stolz, Quinn McNemar, Paul R. Farnsworth, and Robert R. Sears, all of Stanford University, were most helpful to the writer in the planning of this study. Professors C. R. Carpenter, Winona L. Morgan, and Robert G. Bernreuter gave generous administrative support to the execution of the study, which was conducted while the writer was a research fellow of the Instructional Film Research Program at The Pennsylvania State University, supported by a grant from the Carnegie Corporation of New York. The writer is most grateful to Dr. Ellen Tessman for her unselfish and highly skilled service as the observer in this study. The help of Leslie P. Greenhill and other staff members of the Instructional Film Research Program, and of Jane A. Bovie, Mary C. Lane, and Barbara W. Norman, staff members in the Department of Child Development and Family Relations at The Pennsylvania State University, is gratefully acknowledged.

the person's interaction with his environment it occurs as a response to frustration (2). Because aggressive behavior so frequently evokes retaliation or punishment, direct acts of aggression may come to be replaced by more indirect acts (be attenuated) or to be deflected to less threatening objects or persons (be displaced). Thus many modes of expressing aggression are developed. Fantasy aggression is one of these modes (2, p. 10, p. 46).

Behavior theorists reason that these alternative ways of expressing aggression are dynamically related in that each may serve to reduce aggressive drive. The assertion that any of a diverse variety of aggressive acts can reduce aggressive drive is *the hypothesis of equivalence of forms,* the behavior theory formulation of the "release" notion: "the expression of and act of aggression is a catharsis that reduces the instigation to all other acts of aggression" (2, p. 53).

Evidence for the phenomenon of displacement of aggression has repeatedly been secured (7, 10, 14, 15, 16, 24, 29, pp. 276-280, 31). Moreover, various investigators have found systematic relations between fantasy and overt aggression (6, 17, 18, 19, 20, 27). These findings provide affirmative evidence for necessary preconditions to the antecedent-consequent relation asserted by the hypothesis of equivalence of forms, but none bears directly on that hypothesis.

Direct confirmation for that hypothesis was given by Lewin *et al.* (9) in certain observations that scapegoating by children is followed by a reduction in over-all level of aggression. Stone (26), in an unpublished study reported by McClelland, analyzed the relations among various forms of aggression in college football players. His findings "tend to throw some doubt on the idea that there is a kind of reservoir of aggression which may be lowered by expression through various channels which may substitute for each other if one happens to be blocked" (11, p. 517). However, direct confirmation for the hypothesis as it applies to fantasy aggression has been obtained by Feshbach (3) in his ingenious study of the effect of the experience of writing aggressive TAT fantasies upon situationally-aroused aggression.

The present study tests two hypotheses which were derived from the hypothesis of equivalence of forms. Both concern the effect of fantasy aggression upon subsequent level of aggressive drive. Since aggressive drive is an intervening variable, not subject to direct measure (22, p. 227). two indices of aggressive drive are used: level of aggressive behavior and level of anxiety and guilt. Anxiety is taken as an index to aggressive drive because it is reasoned that in the socialized middle-class child the activation of aggressive drive directly arouses anticipation of punishment (either by others or by the self), which is anxiety. If anxiety accompanies the activation of drive, then changes in drive strength should be accompanied by changes in level of anxiety. The use of level of anxiety as well as level

of aggressive behavior as separate indices to drive strength seemed necessary because of the complex relation which may well exist between aggressive drive strength and overt social aggression in the socialized child.

The two research hypotheses were:

I. *Fantasy aggression reduces the instigation to all other acts of aggression. With the level of aggressive drive held constant, there should be an inverse relation between the expression of fantasy aggression and the subsequent expression of other forms of aggression.*

II. *Fantasy aggression reduces the institgation to all other acts of aggression and therefore reduces aggression anxiety, since the latter is presumed to be a direct correlate of the former. With the level of aggressive drive held constant, there should be an inverse relation between the expression of fantasy aggression and the subsequent behavioral expression of anxiety.*

Procedure

The hypotheses were tested by comparing the play behavior of children after a film-mediated fantasy aggression experience with their play behavior after seeing a control (nonaggressive) film. Each film was presented at a different session, and sessions were separated by a period of one week. Aggressive drive was "held constant" by using each child as his own control. Each child attended both sessions with the same partner, a child of his own sex from his nursery school group. After each film showing, the two children were left alone in a playroom for a 14-minute period, and their play during that time was scored for aggression and for anxiety and guilt by scorers behind a one-way vision mirror.

Subjects

Twenty-four children, 12 boys and 12 girls, participated in this study. Their ages ranged from 3-9 to 5-1. All were enrolled in nursery schools. The children were assigned to partnerships by their nursery school teachers, who were asked to constitute each pair so that the two children would be willing to go with each other and the experimenter to an unfamiliar building for a new experience.

Procedures with the Children

Participation in the study was secured by inviting the scheduled children "to see a movie." The pairs of children accompanied the experimenter to a playroom in another building from that in which their school was housed. The film projector in that room had been set up in advance, and the film was begun as soon as the children were seated in the room. The experimenter observed and rated the children's behavior while the film progressed. When the film ended, she told the children that she must leave "to do some

work in another room for awhile," and that they were to play with the toys in the room during her absence. She stressed that when she returned she would knock on the door before re-entering the room. When this information seemed to be understood by both children, the experimenter wheeled the projector from the room and left the children alone together.

The arrangement of the playroom was the same for each of the 24 sessions. These toys were available to the children: two rubber daggers, two lumps of soft clay, two toy telephones, four soft rubber sponges, a plastic tea set and miniature flatware, seven small toy vehicles, a doll bed containing a doll and bedding, eight inflated balloons, and a large inflated plastic punching toy which stood child-height.

At the conclusion of 14 minutes of scoring of the children's play by the observer and the experimenter, while observing through the one-way mirror, the experimenter returned to the room, terminated the play, and accompanied the children back to their nursery school.

Scoring Procedures

During each film showing, the experimenter assigned two ratings to each child: one on interest in the film, and one on behavioral signs of anxiety. The five-point interest scale[2] was adapted from that developed by Dawson (1) for use in evaluating the entertainment value of children's films. The four-point anxiety scale was developed for this study and made use of a 29-item list of behavioral indicators of anxiety (including such signs as these: grips chair, winces, swallows, wets lips, sucks thumb, breathes rapidly, etc.).

At the conclusion of the film showing, the observer was summoned by a third person to the observation room. She waited in a sound-proof room in another part of the building during each film showing. This isolative procedure prevented the observer's knowing which film had been shown to any children, and thus precluded the possibility that her scoring of the play might be biased with respect to the hypotheses under test.

The observer was joined by the experimenter in the observation room, and both scored the play of both children during a 14-minute period of free play. Their technique of scoring aggression and anxiety and guilt is discussed below. The scores assigned by the observer during the play periods are the ones used in all data analyses; those of the experimenter were used to check the reliability of the observer's scoring.

During the weeks in which the experiment was conducted, the children's nursery school teachers were asked to rate the children on their habits of aggression in the nursery school, using slight modifications of scales developed by Gewirtz (4). These ratings were assigned to 18 of the 24 subjects (the other six being members of other nursery school groups).

[2] Complete copies of the scales used in this study are given in (23).

Experimental Controls

In order to isolate the effects of the variables under study, certain controls were instituted. Some of these have already been mentioned, but all are summarized below:

1. Any child's partner in play was the same person for both play sessions. Thus any differences between sessions could not be attributed to systematic differences in interpersonal stimulation.

2. Sequence effects were randomized. That is, half of the pairs saw the aggression film at their first session and the control film at their second, whereas the other pairs saw the films in the reverse order. Thus any differences between the E and C play sessions could not be attributed to systematic (or sequential) differences between sessions regardless of films.

3. Effects of age, previous experience, and social background were controlled by using each child as his own control. That is, comparisons between each child's behavior under the two conditions constitute the data of the study. This design also serves to "hold aggressive drive constant," as is required by the hypotheses under test.

4. Timing effects were controlled by separating the E and C sessions by an interval of time which was the same for all pairs. The effort to separate the two sessions by just seven days was successful in all but two cases: for 10 pairs the two sessions were separated by seven days, for one pair the two sessions were separated by six days, and for one pair the two sessions were separated by 11 days.

5. Time-of-day effects on level of aggression were held constant; any pair participated in both E and C sessions at the same time of day.

6. Observer bias was controlled by preventing the observer from knowing whether any session was an E or C session. The scores of the observer were used in all data analyses.

7. The combination of sex and session effects was randomized. That is, an equal number of pairs of girls and boys experienced the E session first; a comparable equal number of boys and girls experienced the C session first. Three pairs of boys and three of girls had sessions in the E-then-C sequence; three other pairs of boys and three other of girls had sessions in the C-then-E sequence.

8. Insofar as possible, the two films were matched on all variables except that under test. Realistically, such matching is possible in only a general way unless films are especially produced for experimental purposes, which was not the case in this study.

Operational Definitions

This is a study of the relation between fantasy aggression, the antecedent variable, and strength of aggressive drive, the consequent variable. The

operational meanings which were attached to these terms are given in this section.

Fantasy Aggression

Fantasy aggression was mediated by a 10-minute cartoon film which was selected by three psychologists for its direct, unabashed, and easily comprehensible portrayal of extreme interpersonal aggression. This colored animated film depicts the conflicts which occur between Woody Woodpecker, a well-known picaresque character, and a large Air Force sergeant. Raw aggression and unrelenting hostility dominate almost every scene of this, the E film.[3]

The control film was an animated cartoon portrayal of the well-known fable of The Little Red Hen. This C film,[3] selected by the same judges, was matched in length and in use of color with the E film. Designed to appeal to young children, it is narrated by a calm-voiced woman.

These films were originally chosen because they presented a vivid contrast in the use and non-use of aggressive themes and because they seemed suitable to the level of understanding of young children. Empirical confirmation of the appropriateness of these films was provided by two sets of data: data on the children's interest in the films and data on their anxiety during the films.

Interest in films. Each child's interest in each film was rated[4] by the experimenter during each film showing in the course of the study. A difference score was then obtained for each child, representing the difference between his rated interest in the E film and his rated interest in the C film. A statistical test on these data is impracticable, inasmuch as it is the null hypothesis (no difference in interest between the two films) which we wish to establish. Descriptive data suggest that the films were equated in interest for these children: the mean rating of interest during the E film showings was 3.50, whereas the comparable mean for the C film showings was 3.25. The difference between these two means is insignificant. Fourteen of the 24 children received the same interest ratings for both films. Nine others received ratings which differed by only one point. Only one child's difference score was larger than one point.

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[3] E film: Woody Woodpecker in "Ace in the Hole." A Walt Lantz "Cartune" in Technicolor. Universal Picture, MCMXLII. C film: "The Little Red Hen: Background for Reading Expression." David A. Smart. Coronet Instructional Film, MCML. The instructional and hortatory sequences in this film were cut from the print used in this research.

[4] The reliability of the ratings of interest was not determined, since the experimenter was alone in making these ratings during the study. However, during the period of the preliminary pilot study, the observer as well as the experimenter made interest ratings with eight children. For seven of these, the ratings of observer and experimenter were identical; for the other child, the two ratings diverged by but one point.

Anxiety during film. Were the films effectively different with respect to inducing fantasy aggression? The most relevant evidence for answering this question comes from the ratings of each child's anxiety during each film showing. If the E film's effect was really to produce aggressive fantasy in the child, then the child's anxiety should be greater during the E film than during the C film, since aggression is presumed to be anxiety-arousing in socialized children.

Of the 24, 16 children received a higher rating during the E film showing than during the C film showing, eight received the same rating for anxiety during both films, and no child received a higher rating for anxiety during the C film. These data were analyzed by the sign test (12, p. 357). In accordance with the usual practice, those cases whose difference scores had no sign (i.e., those eight cases whose difference scores were zero) were dropped from the analysis. For the 16 cases whose difference score did have a sign, the difference in rated anxiety between the E and C film showings is significant at the $p < .00002$ level. The finding that the children typically were more anxious during the E than during the C film showing is supporting evidence for the presumption that the E film elicted fantasy aggression. (The writer's confidence in this finding would be greater if the conditions of the rating had more closely approximated objectivity. The ratings of anxiety during the film showings are deficient in two important respects: (*a*) their reliability is not known, and (*b*) they were made by the experimenter with full knowledge of which film the children were watching.)

Strength of Aggressive Drive

During the play periods after each film showing, the play of both children was scored by the observer and the experimenter for level of aggression and level of anxiety and guilt.

The scorers each entered four scores at every 20-second interval, paced by an electric interval timer. Each child received two scores from each of the two independent scorers: one for level of aggression in play and one for level of anxiety and guilt. The scores for each 20-second interval of play ranged from 0 to 3.

Aggression in play. Each scorer observed the play of each child for behavior which might be termed "hostile," "destructive," or "aggressive." Such behavior might be toward the other child, toward a toy, or toward the self. Scorers were instructed to judge the intensity of any aggressive act in terms of both the quality of the instrumental act and the nature of the goal response. If no aggression was observed during the 20-second interval, a 0 was entered. If aggression was observed, its intensity was represented by scores of 1, 2, or 3.

In the course of 14 minutes, 42 separate aggression scores were given to each child. These 42 were summed to obtain the child's total aggression score for the play session. These totals (from the observer's protocols) were used in all data analyses.

The agreement between the observer and the experimenter in scoring was tested by comparing the totals from the observer's protocols with those from the experimenter's protocols. Inspection revealed that a linear relation obtained between these two sets of scores, and their agreement (i.e., the reliability of the aggression scores) is expressed by the Pearson correlation coefficient, $r = .97$.

This coefficient shows that the two scorers' data on aggression were in unusually high agreement. The high inter-scorer reliability is probably attributable to three factors: (*a*) the intensive self-training of the observer and the experimenter during the pilot study period which preceded the conduct of the study being reported, (*b*) the sensitivity of the scoring technique—the total scores depend on many specific judgments made during very short periods of play, and (*c*) the fact that the sort of aggression which young children display in this free play situation in the absence of adults is much more open, direct, and extreme than that usually seen by students of child behavior.

Anxiety and guilt during play. Each scorer observed the play of each child for behavioral signs of anxiety and guilt. The scoring was guided by a specific list of signs, adapted from the work of Ryder (25, pp. 348-349), which suggest that the child is controlling, suppressing, repressing, inhibiting, or denying his own aggressive impulses or those of his partner. Included in the list were such behaviors as: moralistic comments; tense, stiff, or awkward movements; incompleted or blocked aggressive acts; tics, thumb-sucking, and other "nervous mannerisms"; tense mouth; mask-like expression, etc.

As with the aggression scores, a score of 0, 1, 2, or 3 was entered for each 20-second interval. The child's total score for anxiety and guilt in play was the sum of the 42 separate scores assigned to him during the play period by the observer.

Inspection revealed that a linear relation obtained between the observer's and the experimenter's scores on anxiety and guilt, and the reliability of these scores is expressed by $r = .77$.

This coefficient indicates adequate inter-scorer agreement. The lower reliability of the anxiety and guilt scores, compared to the aggression scores, seems to be a function of the difficulty of the judgment as well as of the relative infrequency of such behavior in this free play situation. That is, the infrequency of occurrence of anxious and guilty behavior meant that the scores of the group were homogeneous, a fact which tends to depress the correlation coefficient.

Operational Statements of the Hypotheses

Having given operational meaning to the terms of the two hypotheses, we may now state them in the form in which they were tested:

I. *Typically, a child's total aggression score for his free social play after the showing of the E film will be lower than his total aggression score for his free social play after the showing of the C film, under the conditions of this experiment.*

II. *Typically, a child's total score on anxiety and guilt for his free social play after the showing of the E film will be lower than his total score on anxiety and guilt for his free social play after the showing of the C film, under the conditions of this experiment.*

Results

Hypothesis Tests

To test Hypothesis I, a difference score was obtained for each child, representing the numerical difference between his aggression score for the C play session and his aggression score for the E play session. These difference scores were then tested for significance by the Wilcoxon matched-pairs signed-ranks test, a nonparametric test for the significance of the difference between the central tendencies of two related sets of scores (30). This test was used in preference to the more frequently seen t test because for these data it has three important advantages over that test: (*a*) it makes no assumption of underlying normality in the population of scores from which the sample was drawn, (*b*) it permits the various matched pairs to be drawn from different populations, as was done in this study—the two populations being boys and girls, who are known to differ in aggression (28)—and (*c*) it does not assume that the scores used in the analysis are sufficiently exact to be properly subject to the operations of arithmetic. By the Wilcoxon test, $T = 110.5$, a value which is not significant. Somewhat more aggression occurred in the E than the C sessions, but the difference was not significant.

To test Hypothesis II, a similar analysis was made of the scores on anxiety and guilt in play. Somewhat more anxiety and guilt occured in the E sessions (i.e., the difference was in the opposite direction from that predicted), but by the Wilcoxon test ($T = 79$) the difference is insignificant.

Thus, neither in aggression nor in anxiety and guilt were there significant differences between the E and C play sessions, and therefore neither Hypothesis I nor Hypothesis II was confirmed. Those differences which did occur, though insignificant, were in the opposite direction from that predicted. Certain other findings may aid in the interpretation of these results; these are reported below.

Other Findings

By the Mann-Whitney U test (13), a nonparametric technique, the scores were tested for sex differences. The boys showed significantly ($p<.0002$) more aggression in play than the girls, and significantly ($p<.05$) more anxiety and guilt in play than the girls.

The 48 aggression scores were correlated with the 48 anxiety and guilt scores. For these data, $r=.30$ ($p<.05$). Inspection revealed that the relation between the two sets of scores deviates from linearity, a fact which makes the Pearson r a conservative index of the degree of correlation between the two variables. The observed correlation between anxiety and aggression gives some support to the original assumption that both sorts of behavior are dynamically related to strength of aggressive drive.

For the 18 children who came from the same nursery school, a single combined aggression score was obtained for each child by summing the child's two aggression scores (for the E and C play sessions). These combined scores were correlated with the ratings which the children's two teachers had assigned to them. The two teachers rated independently, and their ratings were summed to provide a single group of scores for this analysis. One scale asked the teachers to rate "How often does the child attack other children physically?" The inter-teacher agreement in using this scale was linear and is expressed by the Pearson correlation, $r=.74$. The correlation between these ratings and the children's combined aggression scores, representing their aggression in the two play sessions, is $rho=.68$ ($p<.002$) (8, p. 48). The other scale asked the teachers to rate "How often does the child destroy or damage the property of another child?" The inter-teacher agreement in using this second scale was also linear and is expressed by $r=.69$. The correlation between these ratings and the children's combined aggression scores is expressed by $rho=.56$ ($p<.02$).

Significant differences in aggression and in guilt and anxiety were found between Sessions I and Sessions II, irrespective of which was the E and which the C session. These differences will be reported in a separate paper.

Discussion

Because of the nature of statistical inference, acceptance of the null hypothesis is a weaker conclusion than its rejection. Acceptance of the null hypothesis for a given set of data does not necessarily require rejection of the research hypothesis, or denial of its validity. Before such a strong interpretation is put on the finding of no differences, certain alternative interpretations of the results of the hypothesis tests must be considered.

In the first place, the measurement of the variables may be examined for sensitivity and appropriateness.

The evidence is that the measures of aggression and of anxiety and guilt were sufficiently sensitive. This is indicated by (*a*) the good inter-scorer agreement, (*b*) the fact that the measures discriminated between sexes, (*c*) the fact that the measures discriminated between Sessions I and Sessions II, and (*d*) the significant correlations between the aggression scores and the teachers' ratings of habits of aggression.

The appropriateness of the measures as indices of strength of aggressive drive may, however, be questioned. It seems likely that the aggression scores were more directly reflective of habit strength than of drive strength. This interpretation is supported by the finding that teachers' ratings of habits of aggression correlate significantly with the children's aggression scores for the play sessions. It is also supported by the extremely significant sex differences.

Second, we should point out that only one E and one C film were used in this study, and that it would be quite inappropriate to generalize from the findings of this study to the effect of all films (5). Moreover, perhaps the experience of fantasy aggression in young children occurs most strongly with stimuli which are immediately and intimately familiar to them. The hypothesis deserves a test with films which portray aggression by young children in a familar environment—in a home, neighborhood, or nursery school.

Finally, it may be that the application of the hypothesis of equivalence of forms to drive-produced aggression is premature. The hypothesis was originally formulated in behavior theory to apply to frustration-produced or situationally-aroused aggression, and perhaps we should seek its verification in this context before applying it to drive-produced aggression.

Before concluding this discussion, we should caution that this study was addressed to only one possible effect of film violence: the effect on strength of aggressive drive. Violent films may well have other effects, particularly on children's beliefs, their role-perceptions, and perhaps their values and attitudes. No evidence on these possible effects was gathered in this study. Further research on the effects of violence in the mass media is necessary before we can even begin to attempt a comprehensive and well-grounded appraisal.

Summary

The behavior theory hypothesis of equivalence of forms was tested as it applies to the effects of film-mediated fantasy aggression on strength of aggressive drive in young children. The free play of like-sexed pairs of children in the absence of adults was observed under two conditions: after a highly aggressive cartoon film and after a "matched" nonaggressive film. Play was scored for aggression and for behavioral signs of guilt and anxiety. These scores did not differ significantly for the two conditions. Significant

sex differences and session differences were found, and the children's aggression scores correlated significantly with teachers' ratings of habits of aggression in the nursery school. These findings suggest that the acceptance of the null hypothesis with respect to the hypothesis of equivalence of forms may be due to the inappropriateness of the scores as indices of drive strength, and that the hypothesis of equivalence of forms should be tested with films of greater immediacy and in a situation in which frustration-produced aggression is aroused.

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ANXIETY IN CHILDREN, SCHOOL ACHIEVEMENT, AND INTELLIGENCE

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The authors, with Palermo (1) have previously reported on the children's form of the manifest anxiety scale (CMAS) and on some of its relationships with learning tasks (2, 3). This scale is an adaptation of the Taylor manifest anxiety scale for adults (4), which is in turn patterned after the Minnesota Multiphasic Inventory.

The purpose of this paper is to report on correlations between anxiety as defined by the score for the CMAS, academic achievement as measured by the Iowa Every Pupil Test (IEPT), and intelligence as measured by the Otis Quick Scoring Mental Ability Test, Form B (Otis). Intelligence test data are available only for the sixth grade groups of the fourth, fifth and sixth grade public school population that served as subjects for the present study.

SCHOOL ACHIEVEMENT

Table 1 presents the correlations, by grade and sex, between anxiety scores and sub- and composite scores on the IEPT. These two tests were administered within a week of each other by classroom teachers.

Thirteen of 30 computed relationships between anxiety and school achievement were found to be significant. No consistent pattern of relationship is manifested for the fifth grade population nor for fourth grade boys, but relationships run from moderate to high for fourth grade girls and sixth grade boys and girls. For groups where relationships exist, there is a tendency for the more complicated skills (reading, arithmetic and composite performance) to suffer more interference from anxiety than the simpler, mnemonic skills such as spelling. Also, where a pattern exists, there tends to be more interference for girls than for boys, with the exception

[1] The authors wish to express appreciation to Mr. David S. Palermo for his valuable work in helping to secure and process the data on which this paper is based; to Mr. Buford Garner, Superintendent; Mr. David Stewart, Coordinator of Elementary Curriculum; and Mrs. Sylvella Jacobsen, Psychologist, all of the Iowa City Public Schools; and the 15 Iowa City classroom teachers who administered tests, as well as the four elementary school principals concerned, for their help in making this study possible.

TABLE 1

CORRELATIONS BETWEEN THE CMAS SCORES AND ACADEMIC ACHIEVEMENT MEASURED BY THE IEPT (SUBSECTIONS AND COMPOSITE SCORE)

Grade, Sex	*Vocabulary*	*Reading Comprehension*	*Spelling*	*Arithmetic Computation*	*Composite*
4 B	.00 (53)	—.10 (53)	—.03 (52)	—.13 (52)	—.11 (51)
4 G	—.20 (56)	—.26* (56)	—.23 (57)	—.35**(57)	—.38**(52)
5 B	—.20 (66)	—.08 (66)	—.28* (66)	—.16 (66)	—.18 (66)
5 G	—.11 (60)	—.08 (60)	—.14 (60)	.05 (60)	—.12 (60)
6 B	—.33**(69)	—.33** (69)	—.21 (70)	—.74** (70)	—.32**(68)
6 G	—.58**(51)	—.52** (50)	—.41**(51)	—.57** (52)	—.61**(48)

NOTE.—*N*'s are given in parentheses following each *r*. All *r*'s are Pearsonian.

* Significant at or below the .05 level.

** Significant at or below the .01 level.

of sixth graders and arithmetic. This may be a function of the higher anxiety and L score means for girls or of their generally greater variability (1), and of their stronger academic motivation. It should be added that the CMAS has been useful in predicting performance in complex learning tasks for fourth and fifth graders in other studies (2, 3).

Table 2 shows the same achievement variables' correlations with anxiety scores, but for a population from which has been excluded all children who show L scores of five or higher. (It will be remembered that the L score is high for children who deny that rather universal truths are characteristic of them; who say, for example, "I never lie," or "I always have good manners.")

The correlations in Table 2 show patterns almost identical to those in Table 1. The exclusion of high L-score subjects results in slight reductions in precision of predicting academic success for fourth grade girls, slight additional precision for sixth graders. The over-all pattern, then, is not consistent and the exclusion of the high L-score subjects, of course, results in a substantial reduction in *N*.

INTELLIGENCE

The Otis results were available for the majority of the sixth grade population. These too were given by classroom teachers, and were administered approximately three months after the administration of the CMAS and IEPT, and after the promotion of the sixth grade to junior high school, with some resultant loss of *N*.

For the population of 55 sixth grade boys so tested, the Pearsonian *r* between the Otis and the CMAS was —.16, nonsignificant; for the 45 sixth grade girls, this *r* was —.43, significant at less than the .01 level.

TABLE 2

CORRELATIONS BETWEEN THE CMAS AND ACADEMIC ACHIEVEMENT MEASURED BY THE IEPT (SUBSECTIONS AND COMPOSITE SCORE), WITH HIGH CMAS L SCORES REMOVED FROM THE POPULATION

Grade, Sex	*Vocabulary*	*Reading Comprehension*	*Spelling*	*Arithmetic Computation*	*Composite*
4 B	.00 (33)	.00 (33)	—.01 (33)	.01 (33)	.00 (32)
4 G	—.21 (39)	—.23 (39)	—.19 (39)	—.34* (38)	—.35* (36)
5 B	—.22 (58)	—.10 (58)	—.29* (58)	—.18 (58)	—.22 (58)
5 G	—.06 (48)	—.09 (48)	—.04 (48)	.19 (48)	—.10 (48)
6 B	—.37**(63)	—.36**(63)	—.25* (64)	—.80**(64)	—.34**(62)
6 G	—.58**(47)	—.52**(46)	—.42**(48)	—.58**(48)	—.65**(45)

NOTE.—*N*'s are given in parentheses following each *r*. All *r*'s are Pearsonian.

* Significant at or below the .05 level.

** Significant at or below the .01 level.

Partial *r*'s were computed for the composite score on the IEPT and anxiety, with intelligence held constant. This computation revealed a partial *r* of —.28 for boys, significant at less than the .05 level; and of —.45 for girls, significant at less than the .01 level.

ANXIETY, ACHIEVEMENT AND INTELLIGENCE

The relationships reported above suggested to the authors that the anxiety score might be useful in the practical task of predicting school achievement. Hence, multiple correlations of anxiety and intelligence with the composite score on the IEPT were computed. For this population of sixth graders, *r* between Otis and the composite IEPT for the 55 boys was .56, for the 45 girls, .79. Recomputations of the relationship between anxiety score and composite IEPT score for these populations showed an *r* of —.32 for boys, —.59 for girls (nonsignificant shifts from the larger original population).

The resulting multiple *R*'s are, for boys, .61, and for girls, .84. These represent in each case a small improvement (.05) in prediction from what can be done with Otis score alone.

SUMMARY AND CONCLUSIONS

Both the anxiety and the L score from the children's form of the manifest anxiety scale were found to be related to school achievement, most strongly for the sixth grade portion of a fourth, fifth and sixth grade public

school population. The anxiety score was also significantly related to intelligence for sixth grade girls, but, for both sixth grade girls and boys, it retained significant relationships with school achievement when intelligence was partialled out. A small contribution to prediction of academic achievement by the anxiety score, over and above the predictive efficiency of intelligence alone, was found for sixth grade boys and girls.

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